Media Malpractice in Canadian Newspaper Coverage of the Arthritis Drug Celebrex.
Guidelines for Journalists Covering Medical News

by
Allison Gandey

A thesis submitted to
the Faculty of Graduate Studies and Research
in partial fulfillment of
the requirements for the degree of

Master of Journalism

School of Journalism and Communication

Carleton University
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May 9, 2003

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Media Malpractice in Canadian Newspaper Coverage of the Arthritis Drug Celebrex.
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ABSTRACT

Medical news has gained enormous popularity in recent years. This study examines Canadian newspaper coverage of medical news using the arthritis drug Celebrex as a case study. Arthritis is the leading cause of disability in Canada and the new nonsteroidal anti-inflammatory drug quickly became the most popular choice for arthritis sufferers. This qualitative content analysis looks at Canadian newspaper coverage of Celebrex. While the watchdog role of the press tends to encourage journalists to examine issues critically, often with scepticism and doubt, this did not appear to be the case in much of the news coverage of Celebrex. Most journalists reported Celebrex marketing messages and pharmaceutical company claims as unattributed facts in news copy. This study concludes with guidelines for journalists covering medical news. These 15 step-by-step suggestions for science and medical reporting offer simple and cost effective ways to assist journalists in becoming more critical consumers of scientific data.

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I dedicate this work in memory of my grandmother Anne Gandey. She helped me write my first story when the ABCs were new to me and she passionately conveyed the value of education. She never had the opportunity to write a thesis so I place her name on mine and pray that her dream is fulfilled.

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Chapter 1

The Rise of a Blockbuster New Drug

It was bigger than Viagra. The arthritis drug Celebrex broke sales records and quickly rose to blockbuster status. In the three-month period after its introduction, Canadian pharmacies filled more than 428,000 prescriptions for the new drug, worth almost \$21 million, according to health information company IMS Health Canada. The second most successful new drug, Viagra, managed just over \$13 million in sales in three months. In Celebrex's first full year on the market, nearly 4 million prescriptions were filled, worth \$237 million in Canada alone. But despite Celebrex's unprecedented success, physicians and researchers from around the world were bitterly disputing its advantages and disadvantages. Many questioned the drug's safety and efficacy and claimed that Celebrex wasn't worth the expense. The new product is a nonsteroidal anti-inflammatory drug (NSAID) and costs as much as 15 to 20 times more per month than generic NSAIDs [1].

Arthritis drugs have a long history of causing gastrointestinal problems. After being approved for use in Canada in 1999, Celebrex was marketed as a safe stomach alternative. It is said to block the cyclooxygenase-2, the enzyme involved in inflammation, without affecting the cyclooxygenase-1 enzyme, which can lead to stomach pains. But the fine print on the drug's own product monograph cautions, "Serious gastrointestinal toxicity such as bleeding, ulceration and perforation of the stomach, small intestine or large intestine can occur at any time without warning..."

Celebrex was the topic of much debate in the medical community. While the new arthritis drug appeared promising, how did it become a Number One selling drug in Canada so quickly? The astonishing sales figures for Celebrex raise many important questions. Did Canadians understand the risks involved with any new product? And what was the news media's role in this story? While the first two questions will be touched upon, the third is the focus of this study.

Media Coverage of Celebrex

Celebrex was the topic of a large number of Canadian newspaper articles. While the watchdog role of the press tends to encourage journalists to examine issues critically, often with scepticism and doubt, this did not appear to be the case with Celebrex. This study looks at 115 newspaper articles about Celebrex published in eight Canadian newspapers. Daily newspapers were selected instead of television or radio news reports because the printed word facilitated a content analysis of this nature. The news stories were published in *The Chronicle-Herald* (Halifax), *The Montreal Gazette*, *La Presse*, *The Ottawa Citizen*, the *Toronto Star*, *The Globe and Mail*, *The Calgary Herald* and the *Vancouver Sun*. These included stories from December 1997, when the first report about Celebrex appeared in the sample, and November 2002. In the vast majority of articles, reporters reprinted many of the Celebrex marketing messages and pharmaceutical company claims as statements of fact in news copy. Celebrex is a product of science and all scientific endeavours have areas of uncertainty. Yet the media generally overlooked these uncertainties and published a large number of Celebrex-friendly stories that served the interests of the drug's promoters. This study raises important questions about the

quality of medical news coverage in this country. Assessing news coverage of arthritis treatments is important since arthritis is the Number One cause of disability in Canada.

Arthritis: A National Epidemic

According to Statistics Canada, arthritis is the second leading chronic illness after allergies, afflicting almost 4 million residents [2]. The annual cost of musculoskeletal diseases has been estimated at more than \$16 billion [3]. About 1 in 5 adults suffer some degree of arthritis and it is the leading cause of medical absenteeism in the workplace. Half of those 65 or older are affected, but arthritis also strikes children.

Arthritis consists of more than 100 conditions, ranging from relatively mild forms of tendonitis and bursitis to crippling systemic forms such as rheumatoid arthritis or osteoarthritis. The term arthritis refers to “arth” meaning joint and “itis” meaning inflammation. Rheumatoid arthritis develops as a result of abnormalities in the body’s immune system and osteoarthritis is the most common form of the disease, sometimes called degenerative arthritis. The conditions most often affect areas in or around joints, which are parts of the body where bones meet, such as knees. The ends of the bones are covered by cartilage, a spongy material that acts as a shock absorber to keep bones from rubbing together. The joint is enclosed in a capsule and lined with tissue called the synovium. The synovium’s lining releases a slippery fluid that helps the joint move smoothly and easily. Arthritis pain is often the result of inflammation in this lining and the disease can be identified using X-rays or blood tests. The cause of arthritis is unknown, but it is thought that certain people inherit a tendency to develop it. Arthritis

may also occur in joints that have suffered previous injury, been subjected to prolonged heavy use or were damaged by prior infection.

Arthritis can be debilitating and forces many of its sufferers to make major life changes. It can impose considerable physical barriers to daily living and people with arthritis may experience trouble walking, bathing themselves or doing simple household tasks like opening a jar. This disease takes a tremendous toll both physically and emotionally and there is no cure.

According to an American College of Rheumatology committee, the ultimate goals in managing arthritis are to prevent or control joint damage, prevent loss of function and decrease pain. In their 2002 “Guidelines for the management of rheumatoid arthritis,” the committee writes that treatment begins with educating the patient about the disease and the risks of joint damage and loss of function, as well as reviewing the risks and benefits of treatments [1]. The committee members emphasize that patients should be referred to physical therapists, occupational therapists, social workers and patient educators. They write that patients should exercise to help improve joint mobility, muscle strength, aerobic fitness and function without increasing fatigue or joint symptoms. A careful balance must be struck between strengthening and protecting the joints.

Most of the guidelines address pharmaceutical solutions for arthritis. It is important to note that seven of the nine American College of Rheumatology committee members had financial ties to the pharmaceutical companies whose products are discussed in the guidelines. The committee members had accepted research funding, worked as consultants for pharmaceutical companies or were shareholders. Despite these links, their report states, “The American College of Rheumatology is an independent, professional,

medical and scientific society, which does not guarantee, warrant, or endorse any commercial product or service.” The committee members write that typical treatments for rheumatoid arthritis include drugs such as: nonsteroidal anti-inflammatories, glucocorticoid joint injection and/or low-dose prednisone. They emphasize the majority of patients with newly diagnosed arthritis should be started on disease-modifying antirheumatic drug (DMARD) therapy within three months of diagnosis. The committee members write that since DMARDs control rather than cure, patients should be periodically reassessed for evidence of disease activity or progression and for any toxic effects of the treatment regimen. They write, “Successful treatment to limit joint damage and functional loss requires early diagnosis and timely initiation of disease-modifying agents. The goal of treatment is to arrest the disease and to achieve remission. Although remission occurs infrequently, patients may benefit from nonpharmacologic, pharmacologic, and if necessary, surgical interventions.”

The Textbook of Rheumatology, a popular text for medical students, includes chapters on “Nutrition and rheumatic diseases” and the “Psychosocial management of rheumatic diseases” [4]. Joel M. Kremer writes that diet may profoundly affect rheumatic diseases, but this view continues to be hotly debated [5]. Liv Marit Smedstad and Matthew H. Liang write the psychological component of disease management must not be overlooked. “Psychologic impairment is an intrinsic component of all diseases, and managing it will enhance the medical, surgical, and rehabilitation program” [6, p.534].

In the “Therapeutic approaches to rheumatic diseases” section of Arthritis and Allied Conditions: A Textbook of Rheumatology, Karen K. Nishihara and Daniel E. Furst write about aspirin and other nonsteroidal anti-inflammatory drugs [7]. They write

that while these therapies offer some advantages, they are unable to prevent or slow joint damage. The authors write that popular drugs are non-addictive and have side effects that are generally mild and reversible. But they emphasize adverse events including gastrointestinal bleeding and liver damage can occur. So which NSAID is best? The authors write that although the mechanisms of action may differ, they all have demonstrated efficacy and no NSAID can be considered superior, although individual responses differ.

In Rheumatic Diseases: An Introduction for Medical Students, author Terence Gibson raises similar points about aspirin and NSAIDs [8]. But he also makes reference to concerns that osteoarthritis may be accelerated by the use of these drugs.

The American College of Rheumatology guidelines published in 2002, report that patients with rheumatoid arthritis are nearly twice as likely as patients with osteoarthritis to have serious complications from NSAID treatment. The guidelines say that the choice of available agents is based on considerations of efficacy, safety, convenience and cost. The committee members write that COX-2 inhibitors are no more effective than other NSAIDs and may cost significantly more per month of treatment than generic NSAIDs.

The Dawn of COX-2

In 1971, researchers discovered that NSAIDs such as aspirin act primarily by inhibiting the production of prostaglandins. Prostaglandins are the body's way of regulating such essential phenomena as the widening and narrowing of blood vessels, the contraction of muscles and the development of the inflammation associated with arthritis. In 1982, Drs. John Vane, Sune Bergström and Bengt Samuelsson were awarded a Nobel Prize in

physiology and medicine for showing NSAIDs inhibit the cyclooxygenase enzyme, which is involved in the production of prostaglandins.

In the early 1980s it was discovered that the level of COX enzyme rose in inflamed tissue. Celebrex was conceived in 1991 when researchers discovered there are two COX enzymes. The COX-1 enzyme seemed to affect only the housekeeping prostaglandins while the COX-2 enzyme specialized in pain and inflammation. Researchers found one that specifically bound to COX-2.

Industry-produced promotional documents say that scientists led by Dr. Philip Needleman of G.D. Searle and Company, which was then owned by Monsanto Corporation made this discovery. But the University of Rochester disputes this and says its scientists led by Dr. Donald Young discovered it. This was the subject an unsuccessful patent infringement lawsuit filed by the university in April 2000. Judge David G. Larimer of the U.S. District Court in Rochester ruled the patent invalid in March 2003. He said the patent did not contain a detailed enough written description of the invention nor enough information to enable others to duplicate the work.

When Celebrex was developed, it was initially called Celebra and excitement began to build about a new “super-aspirin”. Celebra was renamed before its U.S. launch due to concerns the original name was too similar to other unrelated products already for sale.

On December 31, 1998, the U.S. Food and Drug Administration gave notice that Celebrex could enter the market. The FDA listed Celebrex as a nonsteroidal anti-inflammatory drug. In a news release, the FDA states, “Additional studies in many thousands of patients would be needed to see whether Celebrex actually causes fewer serious gastrointestinal complications than other NSAID products” [9].

In mid-April 1999, after a fast-track review, the Health Protection Branch of Health Canada also allowed Celebrex to enter the market. Health Canada classifies approved drugs into three categories. Category One medications are those that provide a substantial improvement over existing medicines. Category Two drugs offer a promising alternative and Category Three products provide moderate, little or no improvement over existing medicines. Health Canada classified Celebrex in Category Three. As in the U.S., Celebrex was listed in Canada as a NSAID.

The manufacturer, Searle, formed a partnership with Pfizer Canada to promote Celebrex, marketing it as a new class of medication called COX-2 inhibitors. Celebrex was publicized as a safe stomach alternative even though the FDA and Health Canada both rejected this claim. Celebrex's own product monograph raises a cautionary flag about the drug's gastrointestinal profile. It states that ulcers, gross bleeding or perforation occurred in about 2 to 4% of patients treated with Celebrex for one year. And it warns that even short-term therapy can present a risk. The product monograph says that patients with a prior history of gastrointestinal bleeding are in even greater danger and have a "10-fold higher risk for developing a gastrointestinal bleed than patients with neither of these risk factors".

Celebrex

The story of Celebrex is a tale of debate and controversy. The new drug sparked both excitement and worry as researchers combed through the data and contemplated possible repercussions. All new medications incite questions and present fresh challenges, and Celebrex was no exception. Researchers debated the benefits and dangers of the new

arthritis drug and Celebrex was the topic of countless articles, debates, conferences, news stories and online discussions. Celebrex was also the topic of a number of lawsuits. It is beyond the scope of this study to include all aspects of the Celebrex controversy, but this review will provide a summary of some of the main points of contention. This chronological overview is meant to afford the reader a basic understanding of the primary areas of debate.

Summary of Key Points of Contention Surrounding Celebrex

1. April 20, 1999 – *The Wall Street Journal* reports Celebrex is linked to deaths and cases of stomach bleeding
2. August and September 1999 – British Columbia officials debate whether or not to include Celebrex on the provincial drug plan
3. September 13, 2000 – Celecoxib Long-term Arthritis Safety Study (CLASS) reports just six-months worth of data on a year-long trial
4. August 22, 2001 – *Journal of the American Medical Association* article questions the role of COX-2 drugs in cardiovascular problems
5. March to May 2002 – Researchers begin questioning whether or not Celebrex is linked to cases of meningitis and impaired bone mending
6. May 23, 2002 – Health Canada issues an advisory warning that Celebrex users are at serious risk of developing ulcers
7. June 4, 2002 – Express Scripts, one of the largest pharmacy benefit management firms in North America, publish utilization studies that find COX-2s are prescribed inappropriately
8. June 17, 2002 – Health Canada announces conditional approval for Celebrex for use in cases of familial adenomatous polyposis, a rare hereditary disease that often leads to colorectal cancer

Wall Street Journal Report Links Celebrex to Deaths and Cases of Bleeding

One of the first major controversies surrounding Celebrex occurred shortly after the drug was approved for use in Canada. On April 20, 1999, *The Wall Street Journal* published a report from Washington about 10 deaths and 11 cases of gastrointestinal bleeding involving U.S. patients taking Celebrex [10].

Searle and Pfizer issued a news release that states, “A medical review of the individual reports indicates no direct connection between usage of the drug and any of the reported events” [11]. Dr. William Bensen appears in the news release. Dr. Bensen is a Hamilton rheumatologist and the lead Canadian investigator, who supposedly saw more patients in Celebrex clinical trials than any other investigator in the world. Dr. Bensen is also a paid consultant for Searle and Pfizer. He is quoted as saying “I am not at all concerned about this article from the U.S. and I am looking forward to prescribing Celebrex for my patients.” And, “Doctors will undoubtedly feel more confident prescribing a medication that is safer and we’ll likely see an improvement in patient compliance because the ‘fear factor’ associated with traditional anti-inflammatories is greatly reduced.”

One by one, provinces from across the country included Celebrex on their provincial formularies. The provinces involved therefore paid for the cost of Celebrex for people covered by provincial drug plans, such as those over 65 years of age or hospitalized patients. This represents an important market for pharmaceutical companies. The majority of provinces approved Celebrex only for limited use, noting the more expensive drug should be tried only after other NSAIDs have been deemed ineffective or have proved excessively toxic for specific patients. The provinces decided that even

though Celebrex offers no advantages over other NSAIDs, it provides an alternative and might prove beneficial to some patients under specific circumstances. This restriction was intended to limit Celebrex's use, but physicians are not required to comply with stipulations and the drug continued to be prescribed in record numbers.

Celebrex rapidly achieved the \$1 billion benchmark worldwide, making it the “envy of the whole pharmaceutical industry”, according to Zosia Chustecka, a journalist for jointandbone.org, a specialized news website for rheumatologists [12]. She writes, “Celebrex in particular has been much admired within industry circles for its meteoric rise – its take-off has broken all previous records.”

British Columbia Officials Oppose Celebrex

Despite the drug's widespread popularity, British Columbia did not initially include Celebrex on its provincial formulary. The University of British Columbia Therapeutics Initiative is an organization that publishes independent evidence-based reports. The group has no financial ties to the pharmaceutical industry and it helps the health ministry decide what new drugs get covered. The Therapeutics Initiative, led by Dr. James Wright, decided not to include Celebrex because it said there were insufficient data available about the new drug. In a letter sent to pharmacists, doctors and the provincial government, the group said Celebrex was available for sale in Canada before any of the research evidence demonstrating safety and effectiveness was published. The group members wrote that it is unusual to obtain approval for a new drug without full publication of at least one relevant clinical trial [13].

Health Canada approved Celebrex based on clinical trial reports that found the drug to be safe and effective. There is no requirement that research data be published prior to approval. But the Therapeutics Initiative maintained that without sufficient published evidence, it is impossible for others to assess whether Celebrex was better than other medications such as aspirin, Tylenol, ibuprofen and naproxen. In its letter, the Therapeutics Initiative emphasized that published data are fundamental to scientific inquiry. Without publication of trial reports, an essential component of the scientific method is lost. Full disclosure of experimental methods and analysis is needed so that the research can be replicated, critically appraised and accepted or refuted. "When the Therapeutics Initiative draws conclusions about drugs, we want others to be able to review the same data and independently verify or refute our interpretation of the evidence." British Columbia did eventually approve Celebrex for drug plan coverage, but the province did so under extremely tight restrictions.

Large Celebrex Study Sparks Controversy

In March 2000, the drug company Pharmacia bought Searle becoming the new owners of Celebrex or celecoxib, its chemical name. Pharmacia continued to promote the arthritis medication jointly with Pfizer Canada. The new Celebrex manufacturers sponsored a clinical trial of more than 8,000 arthritis patients. The trial was called the Celecoxib Long-term Arthritis Safety Study (CLASS) and the results were published in the *Journal of the American Medical Association* [14]. The trial findings were authored by 16 medical professionals, 11 of whom were medical doctors; all either worked for Pharmacia or were paid consultants for the company. The study by

Drs. Fred E. Silverstein, Gerald Faich, Jay L. Goldstein and colleagues showed that Celebrex administered at dosages greater than those currently permitted by regulators was associated with a lower incidence of ulcers and gastrointestinal toxic effects compared with other NSAIDs at standard dosages. The study authors reported that more than half (57%) of the patients received treatment for six months.

But other researchers, including the Therapeutics Initiative, noticed a problem. The *JAMA* article reported six months worth of data, but the clinical trial lasted a year. Researchers found the complete trial data on the U.S. FDA website. When all of the information was considered, most of Celebrex's supposed safety advantage disappeared. Despite complaints by the Therapeutics Initiative and others, *JAMA* was initially reluctant to acknowledge the error. It wasn't until *Washington Post* reporter Susan Okie became involved that the journal conceded that it had a problem with the study's authors. "I am disheartened to hear that they had those data at the time that they submitted [the manuscript] to us," *JAMA* editor Catherine DeAngelis told the *Washington Post* in August 2001 [15]. "We are functioning on a level of trust that was, perhaps, broken."

The controversy spilled over onto the pages of subsequent issues of the medical journal. In a letter published in *JAMA*, Dr. Wright, head of the Therapeutics Initiative, and colleagues write, "The trend toward an increased risk of serious adverse events, particularly with celecoxib long-term therapy, is particularly concerning. The unfortunate result of the selective and partial reporting of the CLASS study is that it could mislead physicians and patients. Until there is a better understanding of the risks of serious adverse events with COX-2 selective drugs, these drugs should be prescribed with caution" [16, p.2398].

The three lead authors of the CLASS report published a response [17]. Drs. Silverstein, Faich and Goldstein maintained their intent was not deception. “In retrospect,” the doctors wrote, “we acknowledge that we could have avoided confusion by explaining to the *JAMA* editors why we chose to inform them only of the six-month analysis, and not the longer-term data that were available to us when we submitted the manuscript. We submitted only this information because the authors believed the six-month data were the most scientifically and clinically valid.” Six months of data were presented, they said, because more patients withdrew from comparison groups in the second half of the study, biasing later findings.

COX-2 Drugs May Incite Cardiovascular Problems

Drs. Debabrata Mukherjee, Steven E. Nissen and Eric J. Topol raised new concerns about Celebrex in another *JAMA* article [18]. Their meta-analysis of existing trial results was called “Risk of cardiovascular events associated with selective COX-2 inhibitors.” The authors made note of their study’s limitations and concede that comparing patient populations in different trials is not ideal. Despite these limitations, they warn that current data suggest new drugs such as Celebrex may lead to heart problems. The authors conclude COX-2 inhibitors possess a spectrum of biological effects both favourable and unfavourable. They write, “We believe it is mandatory to conduct a trial specifically assessing cardiovascular risk and benefit of these agents. Until then, we urge caution in prescribing these agents to patients at risk for cardiovascular morbidity.”

The study by Mukherjee, Nissen and Topol was met with a flurry of letters, ten of which were published in a subsequent issue of *JAMA* [19-28]. Four of the letters were

written by physician-consultants from Pharmacia, Pfizer and rival COX-2 manufacturer Merck Frosst [21, 22, 27, 28]. Merck launched its competing product, Vioxx, whose chemical name is rofecoxib, about six months after Celebrex was already on the market. It was racing to gain ground. Some of the physicians suggested alternative explanations for the cardiovascular findings and others complained the study design was flawed. Still others offered additional findings that appeared to support the authors' results. In a reply to the letters, Mukherjee writes, "The purpose of our article was to raise concern about the potential risk of COX-2 inhibitors and to spur necessary research to answer this question definitively. We have fulfilled our objective if we have convinced physicians that such trial is warranted" [29, p.2812].

In a news release addressing this issue, Pharmacia and Pfizer stated they "strongly support the cardiovascular safety profile of Celebrex" [30]. They wrote, "The article in *JAMA* is not based upon any new clinical study. The companies believe it is essential to exercise extreme caution in drawing any conclusion from this type of analysis. Furthermore, it is inconsistent with the clinical experience of Celebrex." Pharmacia and Pfizer also pointed out the cardiovascular safety profile of Celebrex was evaluated and considered acceptable months earlier by the U.S. FDA.

In a second news release, the companies stated, "Pharmacia and Pfizer disagree strongly with the speculation concerning a cardiovascular class effect associated with coxibs" [31]. They wrote, "It is well accepted that different molecules in the same therapeutic class may manifest distinct toxicity profiles." They suggested that competitor Merck Frosst's new COX-2 drug Vioxx may present this negative cardiovascular profile, possibly because of differences in the ways the compounds are excreted from the body.

“Celebrex is excreted from the body primarily through the intestines, while Vioxx is eliminated primarily through the kidneys. Since kidneys play an important role in regulating blood pressure and fluid balance, this renal exposure may account for the differing cardiorenal profiles of these two medications.”

Celebrex Linked to Meningitis and Impaired Bone Mending

But the Celebrex debate didn't stop with the heart. Other reports linked Celebrex to cases of meningitis and it was also hypothesised that Celebrex might impair bone mending. Researchers debated whether or not patients with broken bones should avoid taking the arthritis drug. None of this seemed to affect Celebrex's popularity and the new drug continued to fly off store shelves.

Health Canada Advisory Warns of Serious Ulcer Risk

In May 2002, more than three years after Celebrex was approved for use here, Health Canada issued an advisory warning that people taking Celebrex are at serious risk of developing ulcers [32]. A Health Canada spokesman said the advisory was made after analysis of Pharmacia's CLASS results determined that Celebrex does not offer gastrointestinal benefits compared with two other NSAIDs, Voltaren (chemical name diclofenac) and ibuprofen. “This clinical trial has shown that there is in fact no difference between the three drugs alone when it comes to gastrointestinal illness,” said Ryan Baker of Health Canada [33]. The advisory also cautioned against taking aspirin with Celebrex because the combination dramatically increases the risk of ulcer complications. While Health Canada is still evaluating this risk, regulators cautioned patients with a history of

hypertension, fluid retention or heart failure to talk with their doctor before taking Celebrex. The advisory suggested patients seek immediate medical attention should they develop these symptoms or experience shortness of breath or chest pain while taking Celebrex.

Pharmacia and Pfizer also issued a warning. The letter dated May 13, 2002, was published in consultation with Health Canada and alerted healthcare professionals about the CLASS clinical trial findings [34]. The study indicated Celebrex offered no gastrointestinal advantages over competing medications. In bold type the letter emphasized, “No statistically significant differences were demonstrated for the incidence of complicated ulcers at the doses studied among the three treatment groups in all patients.” The letter warned of the potential for gastrointestinal bleeding, liver and kidney complications. It reminded healthcare professionals that the contraindications for Celebrex are the same as those for other NSAIDs and offered a long list of Celebrex’s side effects.

Studies Find Celebrex Prescribed Inappropriately

At an annual conference sponsored by Express Scripts, one of the largest pharmacy benefit management firms in North America, the cost-effectiveness of COX-2 inhibitors was challenged in light of findings of inappropriate use. The conference was held in St. Louis, Missouri in June 2002. In three utilization studies [35], the firm found:

- 29 percent of new COX-2 users were diagnosed with low back pain, a condition regulators had not indicated for COX-2s
- 74 percent of new COX-2 users had no evidence of being at risk for gastrointestinal problems

- more than half of the new COX-2 users had a prescription for less than a 60-day supply of the drug, suggesting that COX-2 agents were not being reserved for those requiring long-term therapy where the risk of gastrointestinal problems is of greatest concern
- the rate of prescriptions for gastro protective medications among COX-2 users was higher than among other NSAID users, contradicting assumptions that COX-2 drugs protect the stomach and are cost-effective
- About half of chronic COX-2 users took aspirin to protect their heart, but half were taking doses of 325 mg per day or higher, more than American Heart Association guidelines say are necessary for cardio protection. The association reports that 75 to 160 mg per day are just as effective as higher doses

“Although we expected to see COX-2 drugs prescribed for conditions other than FDA-approved indications, the extent of off-label prescribing was higher than anticipated,” Dr. Emily Cox, lead researcher for the studies and Express Scripts’ Manager of Outcomes Research, is quoted as saying in a news release [35]. “Additionally, the extent of short-term use, the substantial use in patients not at risk for gastrointestinal adverse events, and the higher than expected rate of co-prescribing with other costly gastro protective agents, calls into question the cost-effectiveness of the overall use of COX-2s in routine clinical care.”

This study was limited by its patient sample. Two of the studies were based on medical and pharmacy claims data for new COX-2 users from January 1, 2000 to May 31, 2000. The study of simultaneous use of COX-2s and over-the-counter pain relievers is based on a telephone survey conducted in December 2001 and January 2002 among members receiving COX-2 medication through mail order. This is a potentially non-representative sample and is an important shortcoming of the studies.

Celebrex Gains Conditional Approval for New Indication

Later in June 2002, Health Canada gave Celebrex conditional approval for use in familial adenomatous polyposis, a rare hereditary disease that often leads to colorectal cancer.

This was a controversial decision given the minimal data about Celebrex for the treatment of this condition. In its conditional approval, Health Canada emphasized the need for confirmatory studies to verify clinical benefits. And in July 2002, Pfizer bought Pharmacia.

A World Leader in Prescription Pharmaceuticals

Pfizer Canada is headquartered in Kirkland just outside Montreal. Its building is only one of many along a stretch of the TransCanada highway rich with many pharmaceutical companies. Most of Pfizer's biggest competitors, including Merck Frosst, are also its neighbours. Inside the Pfizer building, visitors are greeted by a spectacular lobby of modern architecture, polished wood and glossy black flooring. An enormous glittering Pfizer medallion hangs majestically behind the receptionist's elaborate front desk. Along either side of the room are lighted glass cases displaying a collection of Pfizer products. In addition to the assortment of medications on display, there are pharmaceuticals for pets, and various edibles as well, among them are Body Smarts snack bars, Halls, Certs and Hubba Bubba bubble gum.

I met with two Pfizer representatives to discuss Celebrex [36, 37]. Don Sancton, director corporate affairs and Silvie Letendre, the senior manager, praised their newly acquired product calling it a "significant advance" and an "innovative solution". But they wouldn't call Celebrex a super-aspirin. "That was a term that we were actively trying to

dispel because we did not want to be considered that,” Sancton said, speculating the expression may have come from the media. “It wasn’t accurate. What does that mean, a super-aspirin? How is a super-aspirin different from an extra-strength aspirin? It sounded cool, but in trying to describe what Celebrex is, it just doesn’t do the job.”

The Pfizer representatives were asked why Celebrex is marketed as a safe stomach alternative even though its own product monograph warns of gastrointestinal side effects. Letendre responded, “It is an interesting game that’s played out. I don’t know if you are familiar with the various negotiations that go on with the manufacturer, the people who actually research the product, and Health Canada, but it’s basically a very long dialogue that can go on for months and months. And very often they say, ‘If you provide a lot more research and you give us another six or twelve months, we will consider a softer product monograph.’” Letendre says a strict product monograph was accepted so that Celebrex could be sold right away.

Why does Celebrex cost several times more than other NSAIDs? Sancton says people should compare value, not price. And Letendre says medications are priced according to the benefits they offer over existing options. “If you look at the cost in an office at a provincial government level, in isolation of every other factor, you may well think an aspirin is X number of cents and Celebrex is X number cents or dollars, but the reality is for the patient whose stomach will bleed, being on aspirin will cost more to the overall system.” Letendre says it is short-sighted to focus on price alone. She says it is more cost effective to evaluate which medication is more effective for a given profile.

The Pfizer representatives were asked if Celebrex actually reduces gastrointestinal bleeding. The Therapeutics Initiative in British Columbia is among those who have

maintained there were insufficient data to prove this point and its members questioned the drug's safety. Studies presented at the Express Scripts Outcomes conference also seriously questioned the gastrointestinal safety of drugs such as Celebrex. The studies showed Celebrex and others are often improperly prescribed to those who don't really need them. At Pfizer, Sancton and Letendre maintain that people should trust doctors to make appropriate prescribing decisions. Sancton says there was a significant amount of data available to physicians at the time of launch and there was enough information available to spur a priority review from Health Canada, something he is quick to point out does not happen every day. "The number of actual publications in traditional medical journals was a little limited at that time, but there were certainly data available through abstracts from medical conferences and various other means. And certainly that didn't inhibit any other jurisdictions from recognizing the value that Celebrex brings."

The Pfizer representatives were asked whether company-initiated data were sufficient. Perhaps published data in peer-reviewed journals would have offered more value? Concerns raised by the Therapeutics Initiative were offered as an example. Led by Dr. Wright, the group had said without publication of trial reports, an essential component of the scientific method was lost. Sancton says he strongly disagrees. "If they want to look at excuses about how many journal articles are published, that's consistent with the kind of anti-innovation environment they have in B.C. But the data were there and the data were certainly more than sufficient for the other provinces in Canada to give their residents ready access to an innovative product like Celebrex."

A truism of modern clinical pharmacology holds that a drug without side effect is a drug without effect. Letendre says she agrees with this statement and notes that it is also

important to remember that different people have different physiological makeups that respond differently to various products. “No one drug works 100 percent of the time in all patients,” she said.

Sancton says that medical and pharmaceutical advances are very often accomplished in incremental steps. “We can look back now and say we have come a long way from 1950 to 2003; our medical world is a lot different, but how did we get there? Yeah, there were a few significant milestones along the way, but most of the time it is with little tiny steps.”

Letendre says that communicating those steps with the media can be a frustrating experience. She says sometimes reporters fail to contact Pfizer before going to press and that too many reporters don’t do their homework and get stories wrong. Letendre says headlines will sometimes blare negative findings about specific products, but the results may be based on questionable studies. She says after a drug is available for human use, she hates to read about new studies based on “rabbits, lab rats or the Petri dish” because these “may no longer tell the whole story and may worry satisfied users of a product.”

Letendre says she prefers to deal with the medical press because its reporters understand these issues. “It’s wonderful,” she says, “You can often expect a very balanced, thorough piece and it’s great because these publications speak directly to physicians and they matter a lot.” Physicians are important for pharmaceutical companies because people cannot simply buy their products, doctors must first prescribe them.

Letendre says Pfizer tends to avoid sending information to the general media. “Very often we only target the medical press because the lay media just wouldn’t understand so it’s not worth it.” She says when Pfizer would like to share information about a new

clinical trial, for example, that information may only go to a handful of reporters. “We only send our information to health reporters because they know what it means and have the background to do a good job,” Letendre said. But she acknowledged that Pfizer seeks a broader audience for some announcements. “Other times, we extend information to both [the medical press and the general media] knowing very well that the lay press may not understand it,” Letendre said. “Or quite frankly, we’re competing with so many other news stories, we realize that we may not make it in.”

Why Popularize Science and Medicine?

Science is a great human activity and a vital part of our culture. June Goodfield, author of Reflections on Science and the Media, writes that failing to communicate science and medical news would be as absurd as failing to publish novels or show paintings. “Science affects us all, not only through the intellectual excitement it provokes but through the changing perception of ourselves that it causes and the practical benefits – or disasters – that its application brings” [38, p.10].

Thus the reasons for communicating science to the public span a whole spectrum, from the values of education and culture to those of politics and government. In addition, even if it were not true that more and more people desire to influence the decision-making processes, it would still be *essential* in a democratic society for them to be so involved. The present scale of scientific discoveries – especially in the area of biomedical research, or of energy development – makes oversight by the public essential and examination of the long-term social consequences vital [38, p.11].

Of course, not everyone feels that oversight of science and medicine should be in public hands, but this is the philosophy on which a democratic society is predicated, and it is especially important when vast public funds are at stake [38]. Goodfield argues that the

public's right to know about the implications of science and medicine is paramount. She writes the public needs to know, first, the hard facts of scientific discovery and their relationship to past and changing ideas. Second, it needs to know the current scientific and trans-scientific issues, the areas of concern and debate, especially as they relate to the impact of scientific ideas on those social and political issues on which the public will be voting or on which citizens should make their opinions felt. And third, the public needs to know about the actual nature of the scientific process. According to Goodfield, the patterns, the limits, the nature of discovery, the balance of certainty and uncertainty must be made explicit.

The late Carl Sagan, astronomer, educator and author, argued that too many people are ignorant of medical advances. He wrote, "We have a society exquisitely dependent on science and technology, in which the average person understands hardly anything about science and technology" [39, p.39]. He argued this is a dangerous trend and "the clearest imaginable prescription for disaster – especially in a purported democracy. A fascination with pseudo-science is a dangerous foundation on which to base decisions about the environment, healthcare, defence and the many other urgent problems the nation and planet face."

Science writer Marcel C. LaFollette contends that trust in science, faith in science and fear of science are all influenced by beliefs, correct or incorrect, about the accuracy, reliability, and certainty of researchers' methods [40].

Nonscientists cannot independently verify scientists' conclusions: they cannot repeat experiments; they may not even know how to focus a microscope – they must trust the researchers' account of what appears in the lens. When they are couched in authoritative scientific language, all arguments can seem equally legitimate to the person who is not a

scientist; only the scientists' endorsement promotes one and dismisses the other [40, p.110].

Professor Dorothy Nelkin of New York University and author of Selling Science: How the Press Covers Science and Technology, writes that science is frequently presented as an arcane activity outside and above the sphere of normal human understanding, and therefore beyond our control. "Too often the coverage is promotional and uncritical, encouraging apathy, a sense of impotence, and the ubiquitous tendency to defer to expertise" [41, p.162].

Surveys suggest the public is ill prepared to deal with scientific and medical information. According to David Warren Burkett, author of Writing Science News for the Mass Media, the changes wrought by science, engineering, technology and medicine have accelerated so rapidly that they have outstripped the public's ability to prepare for many of them [42]. There is a great need for an intelligent general public that can respond in a rational way to the challenges of scientific, technological and medical research [43]. In order to arrive at a proper assessment of science and medicine, it is necessary to ask appropriate questions of scientists and medical researchers in general. There must be some understanding of the general thought processes of science and medicine if this is to be done [43]. Lafollette argues a new generation of science and medical journalists, alert to the moral, economic, and political implications of research, may succeed in conveying a realistic image and in supplying their audiences with the information necessary to weigh scientific advice wisely [43].

In the foreword to Maurice Goldsmith's book, The Science Critic: A Critical Analysis of the Popular Presentation of Science, the author's son, David, writes:

In our world of complex communication systems, transmitting everything from a heart beat to a space walk, we conduct our daily affairs with an alpha numeric pager on our belt, a radio telephone in our bag, and a faxed copy of the daily newspaper under our arm. We use lap-held computers to pass text at data transmission speed down telephone lines between countries at the cost of a local call.... It is now possible for the artist to express his vision using a digitiser, with nothing in his pen but the means to paint in pixels with a range of colours and freedom never before available to manipulate an endless expression of his truth. Is what the artist doing art or science? Is he not showing that the 'two cultures' are fusing into a new oneness? [44, p.ix]

The news media's selection of science and medical news sets the agenda for public policy. Their presentation of science and medicine lays the foundation for personal attitudes and public actions [41]. They are often the only source of information about the scientific, medical and technical choices that significantly affect people's work, health and lives [41]. Public understanding of the social implications of science, medicine and technology, their technical justifications, and political and economic foundations is in the interest of an informed and involved citizenry. It is also critical to the future of science, medicine and technology themselves [41].

To understand the fundamental challenges in communicating science and medical news, we must first grasp some of the main problems with the fields of science and journalism. Chapter 2 will provide an overview of concerns with science, with journalism and science journalism in particular. It will also address some of the problems with general and specialized reporters. Science and journalism are practised imperfectly and experts from each line of work tend to blame the other. Both specialties remain riddled with problems that impede progress and this chapter will look at some of the main issues.

Chapter 3 will present the findings of a study reviewing 115 Celebrex news stories published in eight Canadian newspapers from December 1997 until November 2002. This

chapter will examine how the journalists from the study newspapers covered the Celebrex debate. It will address whether or not reporting quality varied between general assignment or specialized reporters and other guest authors such as physicians. It will also highlight some of the main problems with the news coverage of Celebrex.

Chapter 4 will look at how pharmaceutical companies influence the media. It will review some of the mass communication research about the framing perspective and will address how corporations attempt to shape the news according to their interests. This chapter will provide an overview of some the public relations and marketing strategies the pharmaceutical industry uses to gain exposure and promote the sale of prescription drugs. It will also look at how some of these strategies were implemented in the case of Celebrex.

This study will conclude with guidelines for journalists covering medical news. These 15 step-by-step suggestions for science and medical reporting are designed to help journalists fulfill their essential function. Armed with vital information about how the health industry operates, journalists should be able to more effectively report these issues. Chapter 5 offers simple and cost effective ways to assist journalists in becoming more critical consumers of scientific data.

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Chapter 2

A Critical Look at Science and Journalism

Every line of work has its flaws, and science and journalism are no exceptions. Both fields are riddled with faults that inspire criticism. This chapter will provide an overview of some of the key problems with each. The purpose of this summary is to familiarize the reader with some of the main concerns with science and journalism. This chapter will also look at science journalists in particular and will study some of the problems inherent to this double-barrelled line of work. The chapter is divided into four sections: problems with science, problems with journalism, problems with science journalism and problems with general and specialized reporters.

Problems with Science

Science, like any other area of expertise, has its faults. I will offer a brief overview of some of them here. This section of the chapter will begin with a general definition of science. It will look at the uncertainty of science, its vast number of specialties and some of the challenges this diversity can engender. The controversial issue of scientific objectivity and the political interests and financial affiliations of scientists will be addressed. This section will study communication barriers in science and will look at the public image of the profession. I will conclude this topic with some general suggestions for how these gaps might be addressed in the future.

What is Science?

Science provides knowledge about what was previously unknown. Knowledge is generally acquired and tested by a system of investigation called the scientific method, which involves asking a question and generating multiple hypotheses to answer it. Hypotheses must make testable predictions that are falsifiable. They must be tested systematically to eliminate those that are wrong. Experiments must be repeatable, carefully designed and whenever possible, carried out under controlled conditions with all variables held constant except the variable under investigation. The hypothesis can then be narrowed down to those supported by data. The scientific method never allows us to prove conclusively that the hypothesis is correct. Rather, scientists disprove a hypothesis, replace the incorrect hypothesis with a modified one and try to disprove this new hypothesis.

Author June Goodfield writes the constraints acting on scientists are of two kinds: those that are imposed by the basic nature of science and scientific methodology and those that have been acquired during the evolution of the profession:

...scientists are engaged in investigating the unknown, and this is a very chancy business indeed. The error rate is inevitably high, and a sensible scientist naturally prefers not to be caught out on the limb of unsupportable assertions and nonreproducible results [1, p.31].

Carl Sagan, astronomer, educator and author, wrote that through the scientific method, science is self-correcting:

Vigorous criticism of new ideas is commonplace in science. While the style of the critique may vary with the character of the critic, overly polite criticism benefits neither the proponents of new ideas nor the scientific enterprise.... The objective of such criticism is not to suppress but rather to encourage the advance of new ideas: those which survive a firm skeptical scrutiny have a fighting chance of being right or at least useful [2, p.44].

When scientists have conducted many different experiments many times and are still unable to disprove a hypothesis, we can be reasonably certain that it is correct, but we are never sure. When a substantial amount of evidence is assembled in favour of a hypothesis, it is referred to as a theory. Uncertainty is therefore a normal and necessary characteristic of scientific work [3].

Uncertainty of Science

Robert J. Griffin, author of “Using systematic thinking to choose and evaluate evidence,” writes that this uncertainty has implications for the non-scientific world:

In fact, the scientist lives in a world in which absolute proof is virtually impossible. Yet, based on the fruits of scientific inquiry, government officials often have to make decisions affecting public policies, including controversial actions such as limiting emissions of greenhouse gases or requiring that additives be put into gasoline in certain cities to reduce urban air pollution. Judges and juries often have to determine, based on scientific evidence, whether plaintiffs have been harmed by hazards such as workplace carcinogens, defective products, or medical malpractice. At best, these decisions are made only after carefully weighing the bulk and quality of scientific findings that bear, pro and con, on the policy or judgment [4, p.226].

It can be extremely perplexing for those who do not understand the nature of science to comprehend its fluidity. Conflicting reports of the benefits and dangers of various substances lead some to wonder about the validity of research. A study may tout the benefits of a drug in one report only to be refuted a few months later by others alerting of dangerous adverse effects. This can leave some bewildered and sceptical. And yet this aspect of the discipline is crucial, an essential part of what makes science effective. Without an array of speculation about the unknown, it would be impossible to make new and compelling discoveries. It is through this system of proving and disproving

hypotheses that scientists are able to learn new information in the pursuit of understanding. Sharon M. Friedman, Sharon Dunwoody and Carol L. Rogers, the editors of Communicating Uncertainty: Media Coverage of New and Controversial Science, write in the preface of their book that perhaps the most common outcome of the scientific process is not facts, but uncertainty.

Ambiguity about what is true and what is not is so ubiquitous that one could define scientific expertise not so much in terms of accumulation of knowledge but by the skill of recognizing and managing uncertainty [3, p.vii].

Many of our current theories are unlikely to be final as we get more information and science progresses by replacing old theories with new. In an article entitled “What future for science?” John Maddox writes that it is tempting to believe we already know most of what there is to know about the world around us [5]. He notes that modern science is still young and the illusion of completeness has been a recurrent theme throughout history. Maddox points to some of the problems that remain in a number of our current theories and emphasizes there are certainly more discoveries to be made. He writes, “as in the past, the big surprises in centuries to come will be prompted by the questions we do not yet have the wit to ask” [5, p.4].

Science Includes Many Specialties

Science is an all-encompassing term that includes a vast range of specialties. Science includes a tremendous variety of activities and is not merely an exercise in the lab. It can have many social, political and economic implications. While some may think of science as one area, it in fact covers a broad range of subjects. This means that an expert in one specialty may know very little about another area included under the enormous umbrella

of science. And the blanket term “scientist” can refer to any number of specialists. A physicist, for example, may know little about chemistry and a rheumatologist may have only a general understanding of gastroenterology. These specialists must rely on one another for the exchange of information. Integrity and professionalism are therefore of utmost importance. But as in all professions where there are strong and weak workers, there are high quality scientists and substandard ones.

Even within specialties, science is based on a long history of trust. After a new theory has been debated, verified and finally accepted, it is treated as a fact. It would be extremely inefficient for every specialist to substantiate every theory. Therefore, many scientific theories are accepted on faith.

Scientific Objectivity?

While objectivity remains an ideal, it is nearly impossible to achieve in any line of work and science is no exception. People approach work with their own perceptions and biases, which render objectivity nearly impossible. Even the best intentioned, conscious of these issues, cannot completely escape their own perspective.

Yet most believe that science is objective knowledge. They argue the truth can be discerned using the scientific method. Professor Alexander Keewatin Dewdney from the University of Western Ontario is a mathematician and environmental scientist. He defines bad science:

A preliminary definition might simply state that bad science happens when someone strays in a fatal way from the scientific method. This usually leads to results that are wrong at worst or grossly distorted versions of the truth at best [6, p.17].

British journalist and sociologist Anne Karpf writes that many believe science is objective knowledge, arrived at through the scientific method which, by trying to falsify theories through rigorous testing in experiment and observation, generates repeatable results that offer incontrovertible laws [7].

But increasingly over the past twenty-five years, this view of science has been contested. Anthropologists, sociologists, historians, feminists, philosophers and others have argued that even the most technical aspects of science, technology, and medicine are forged by social practices shaped by beliefs, values, political and economic interests, which can be studied like those of other groups. Scientific facts are merely statements to which our culture allocates status of 'beyond dispute'; the critics ask how they came to be regarded as 'scientific', 'medical', or factual in the first place [7, p.129].

The notion that science is inherently objective obscures the political interests of its practitioners [7].

Political Interests of Scientists

Advancement and increasing monetary compensation are important to many in the professional world, scientists included. Many seek to move up in their specialty and to be rewarded accordingly. This can encourage the progression of science as specialists push the limits of their field and compete to get there first. But, according to Dewdney, scientific magic happens only when scientists allow the logic of a well-conducted investigation to override personal hopes and fears about outcome. "If there are dreams of glory," he writes, "real scientists keep them, trembling, in the background" [6, p.18]. It is unlikely that anyone could ever be capable of completely forgetting about his or her dreams while conducting a study. The human condition can lead people to unwittingly witness that which they desire to see, potentially skewing results and biasing research.

While it is impossible for scientists to completely escape these realities, a strong sense of integrity and professionalism are certainly a good start.

Financial Affiliations

Scientists must be paid for the work they do and their projects must be financed as well. Funding, however, can be a powerful source of control. Money can come from within organizations in the form of in-house research or it can come from outside contracts, contributions and grants. Funding may take various forms – fellowships, scholarships or even loans and tax breaks, to name a few. Scientific research is regulated to a great extent by sources of funding. Ultimately, these biases reflect the values of those who hold the purse strings [8]. Warren Burkett, author of News Reporting: Science, Medicine, and High Technology, writes that employer restraints might chill public communication. Scientists in industry deal in proprietary information from which their companies expect to profit over competing businesses. Therefore they can be very closemouthed about their work. Documentation in scientific literature is part of the legal evidence for establishing the rights to invention and patent claims. Peer review, including publication of research in reputable journals, remains the first priority for scientists. Increasing the public's understanding of science confers few material rewards [9].

Many people do not understand science and complain that scientists make the situation even worse by either not sharing information at all or by sharing it incomprehensibly. Are scientists bad communicators?

Communicating Science

I know a lot of scientists whom I love, but whose operation in the English tongue reminds me of an elephant on stilts – ponderously inelegant.

– M.W. Thistle (*Science* April 25, 1958)
*scientist who became the chief of the Public Relations
Office of the National Research Council of Canada*

While this assessment may be a little harsh, the fact remains that many scientists are rather ineffective communicators. Scientists tend to do very well within their own circles, but it can be extremely difficult for them to communicate to people outside of their specialty. Habituated to using highly technical terms and qualifying statements with additional conditional clauses, scientists can find it challenging to communicate the main points of their work, which may not even seem relevant to them amid complexities. It is not surprising that people outside the specialty may feel baffled or frustrated by the scientist and may even believe they are incapable of understanding. Many journalists in particular charge that scientists convolute the English language, sometimes beyond repair. Many scientists retort there isn't anything wrong with the way they communicate. They claim the way they relate is a vital component of their work that should not be changed.

While scientists should continue to avoid making definitive statements in their research, it is possible and even desirable for scientists to pare down the use of jargon. A thrombosis, for example, is a blood clot and physicians can choose between the terms. The use of highly technical language or "technilese" should be discouraged. While many argue such tongues allow a linguistic precision unachievable with regular words, in actual fact, they accomplish the exact opposite. It is my belief that speaking technilese and

using acronyms is a thinly veiled attempt to exclude and self-promote. In other cases, technilese is a means to conceal a lack of comprehension. People can hide the information they do not understand by wording things in a passive and highly convoluted way. Whichever the case, this behaviour should be strongly discouraged and rendered socially unacceptable. Over time, specialties have developed separate languages. While this system may provide members a sense of belonging, the disadvantages far outweigh any benefits achieved. Technilese only serves to widen the gap between specialties and hinders the exchange of ideas.

I do not anticipate that removing technilese from the scientific lexicon will entirely eliminate the problem of public understanding. I appreciate that many concepts are counterintuitive and may be difficult to comprehend no matter how they are communicated. I do, however, believe that reducing jargon and technical terms is a step in the right direction. Informing the public and bridging the gap between specialties will help increase the spectrum of debate and pool of ideas. William Bennett, author of “The medium is large, but how good is the message?” writes that he is somewhat sceptical of the notion that scientists are, as a rule, motivated to foster public understanding of their work: “I think there are many reasons, mostly not consciously appreciated, for scientists to prefer a polished public image to genuine public understanding of their work” [10, p.122].

Public Image of the Scientist

In the twentieth century, scientists have been held in predominantly high esteem [11]. The development of antibiotics, the first successful voyage to the moon and the splitting

of the atom created enormous public admiration [11]. As a result, scientists tend to be viewed as highly intelligent and worthy of a privileged status [8]. Professor G. Bruce Doern from the Carleton University School of Public Policy and Administration argues that while science is generally viewed in a positive light, the scientist has frequently been thought of as a socially introverted and hardworking recluse [12]. The image of the mad scientist irresponsibly creating monsters that are dumped in the lap of a society ill prepared to deal with them is a case in point [13]. The public tends to dehumanize scientists, viewing them solely through the lens of their work and professional accomplishments [13]. The time has come for a more holistic view.

The Future of Science

Some experience of popular lecturing had convinced me that the necessity of making things plain to uninstructed people was one of the very best means of clearing up the obscure corners in one's mind.

– Thomas Henry Huxley, Man's Place in Nature (1894)

Science, complete with its own language, customs, values and institutions, has become a culture of its own, apart from the public. This ever-burgeoning gap has dangerous implications. With financial sources at the helm and scientists captaining the ship, who knows where we are going or whether or not we even want to be on this voyage? Sharon Dunwoody and Byron T. Scott, authors of “Scientists as mass media sources,” write that “tribal customs” within the scientific community can act as barriers to communicating science information through popularization and the mass media [14]. Goodfield writes:

Careful strictures – including first publication of new results only in professional journals and only after peer review – are designed to minimize wasting resources on “wrong” research efforts. All very nice

and reasonable, but it results in a second kind of constraint, a strongly negative, frequently unreasonable reaction against “going public” at all. Not only do many scientists have an ambivalent attitude toward the media and public communication in general, but they have an antagonistic, even primitive attitude toward anyone who undertakes any popularization of science at all [1, p.31].

It’s time to bridge the gap between scientists and the general public by opening the channels of communication. This can be done in part by discouraging jargon and technical terms and welcoming the popularization of science.

Problems with Journalism

The scientific world is not the only one to place constraints on the science communication process. The world of journalism also applies many pressures. I will offer a brief overview of some of them here. This subsection will begin with a general definition of journalism. It will look at how the corporatization of the press and pressures from the news business itself affect media coverage. This subsection will take a closer look at deadlines and why certain stories are selected as news while others are omitted. The controversial issue of journalism’s reliance on expert sources and questions about journalistic accuracy and objectivity will be addressed. This subsection will conclude with a look at the public image of journalists and will be followed by another section looking at problems with science journalism in particular.

What is Journalism?

Journalism involves presenting information to the public. Journalists explain facts and describe events to inform, educate and entertain. Ideally, journalists perform a watchdog function in our society as well and help people make informed decisions. Journalism

plays an important role in a democratic society and freedom of the press remains highly esteemed in many western cultures. The late Nicholas Tomalin, a former reporter for *The Sunday Times* in London, wrote about the role of the journalist:

To say that a journalist's job is to record facts is like saying that an architect's job is to lay bricks. True, but missing the point. A journalist's real function – at any rate his [or her] required talent – is the creation of interest. A good journalist takes a dull, or a specialist situation, and makes the readers want to know more about it. By doing so he [or she] both sells newspapers and educates people. It is a noble, dignified and useful calling [15, p.16].

Journalism is at once an information system that seeks to instruct as well as a business that seeks to create and maintain an audience. While maximizing audience sizes can help with the information function of the press, this and many other aspects of press financing can impede journalism.

The Corporatization of the Press

Media ownership is a contentious issue in Canada. Many accuse the companies that own the media of exerting undue control. They charge that industry owns the messages as well as the media. While it is highly unusual and categorically frowned upon for owners to tamper with news stories directly, they do exert other forms of control. Owners select employees and allocate resources according to their own objectives and values. Media practices can negatively impact coverage and advertising plays a pivotal role in determining how much space is available for journalistic coverage. These problems are rooted in the profit-seeking nature of a corporate press. Journalistic efficiency has both economic causes and consequences [16].

Deadlines

Robert J. Howard, author of “Media coverage of emerging and re-emerging diseases behind the headlines,” writes about the gruelling deadlines journalists face:

Unlike scientists who labour over projects for months and years without seeing significant progress or findings, reporters are driven to show daily, tangible findings to their editors who have to meet press and air time deadlines. For reporters the oft heard refrain is, ‘What have you got for me today?’ News by its very nature is just that – new [17, p.1359].

Deadlines are an intricate part of journalism. News organizations must be efficient because they deliver the latest news at a prescheduled time. Efficiency is therefore crucial and work habits and methods that contribute to this goal are essential for the news to be published on time. Herbert J. Gans points out in Deciding What’s News this necessity can have negative effects, however, and dependence on efficiency can pervade story selection and production:

...many considerations are designed to facilitate quick and easy news judgments, both in choosing stories from the mass of available ones and in gleaning relevant facts from an equally sizable mass. Considerations do not exist solely because they are efficient, but they become significant because they are also efficient [16, p.282].

Selecting Stories and Cutting Others

The media decide what is newsworthy. During this process, certain kinds of information are deemed to be more important than others. Some articles become news, some do not. Of the items that are considered newsworthy, some become lead stories and others get buried toward the end. These decisions, although crucial to the functioning of the media, are highly subjective. Often referred to as news judgment, this selection process greatly affects what gets covered and where it appears in the newspaper.

When news stories are prepared, another process of selection takes place. Reporters decide what information to include in the story and what to leave out. They also decide in which order the information will appear, emphasizing specific elements and relegating others to the bottom of the story. Journalists, whether they realize it or not, invite the public to look at the world in highly specific ways. Karpf writes, "In spite of decades of media studies, the idea is still rife that the mass media simply and neutrally reflect events and debates which happen 'out there'. Many people still believe that there's a 'natural fit' between an event or process and its media representation" [7, p.2].

But this view obscures the fact that it's impossible to make a programme on any subject without articulating ideas about that subject.... As any journalist who's wrestled with intractable lumps of information will testify, material and data can't be managed and processed into an accessible form (like an article or programme) without using a 'frame', angle or a peg [7, p.3].

The media tend to believe they are the ones who decide what becomes news, but an increasing number of communications researchers suggest that sources can also significantly influence what gets covered and how [18].

Reliance on Expert Sources

Karpf writes that since journalists themselves can't confer legitimacy (even though people gain a certain authority simply by having appeared on TV or in a newspaper), they try to protect themselves by using only certified experts and authorities carrying an institutional seal of approval.

Journalists are umbilically connected with the world outside. Over the years they develop sources, people who sustain them with information, ideas, and stories. But outside groups also lean on [news organizations], wielding sticks as well carrots in their attempt to influence the media [7, p.110].

Media theorists have long agonized over journalists' reliance on official sources.

Gans argues that heavy reliance on officials by the news media presents a very specific picture of society and its institutions. Adherence to official sources tends to be accompanied by the exclusion of dissident experts and voices [16]. Robert McChesney, author of Rich Media, Poor Democracy, blames reliance by journalists on official sources for the narrow range of news. When the experts disagree on an issue, there is potential for good journalism. But when they agree, there is no debate or investigation whatsoever [19].

Like their scientist colleagues, there is much that journalists are required to accept on faith. While it is customary for journalists to check facts, it would be extremely inefficient to substantiate every single claim made by every source. Karpf writes:

If they had to check out the reliability of each source or piece of information, programmes would never get made and articles never get written, especially on understaffed local programmes or papers. They can't treat each source, each piece of information as equally provisional, all of it only allegedly true. They have to take some on trust [7, p.125].

Journalistic Accuracy

When distant and unfamiliar and complex things are communicated to great masses of people, the truth suffers a considerable and often radical distortion. The complex is made over into the simple, the hypothetical into the dogmatic and the relative into an absolute.

– Walter Lippmann, *The Public Philosophy* (1955)

Peter Calamai, national science reporter for the *Toronto Star*, writes many scientists charge that news reports speculate too much about the potential implications of a finding, play up human-interest angles and employ over-simplistic, over-dramatic headlines.

Many scientists would like the media to practice eat-your-peas journalism, making readers or viewers consume the information that's supposedly good for them, rather than the information that surveys show they prefer – such as the implications of scientific research and some portrait of the newsmaker. As for the headlines, that's like blaming the lab assistant for a memo sent by the department head [20, p.8].

One of the most common critiques of journalism is that reporters make terrible mistakes. Journalists are often accused of misrepresentation and these charges come in many forms. Journalists are frequently disparaged for sensationalism and they are criticized for providing shallow, superficial, meaningless coverage. They are also frequently ridiculed for being ignorant and lazy. Goodfield writes that many scientists believe that too many people in the media always will present the public with simplistic stories rather than struggle to explain complicated truths.

They believe that the contest between the bare fact honestly presented and the flashy headline, or between a difficult and prolonged controversy and a short but exaggerated story, is an unequal one; given a contest between truth and profit, these scientists say, the truth will always go under [1, p.7].

While there are unprofessional journalists, as there are poor workers in any industry, journalists for the most part strive for excellence within the constraints of time and available space. Often people refer to the media's inaccuracies as if accuracy, objectivity and truth were quantifiable.

Journalistic Objectivity?

Objectivity is an important journalistic ideal. Gans writes that journalists seek to exclude conscious values and they do so in three ways: through objectivity, the disregard of implications, and the rejection of ideology (as they define it).

Value exclusion, however, is not solely a goal but also a practical consideration, for it defends journalists against actual or possible criticism, and protects them against demands by powerful critics for censorship and self-censorship [16, p.183].

Robert A. Hackett and Yuezhi Zhao, authors of “Sustaining democracy? Journalism and the politics of objectivity”, argue that while objectivity is often perceived as a positive ideal, it is not possible and actually represents a dangerous façade with many disturbing implications [21]. According to Hackett and Zhao, journalistic objectivity produces partial representations of the world, skewed towards dominant institutions and values, while at the same time, disguising that ideological role from its audiences. Judith Lichtenberg, author of “In defence of objectivity revisited”, acknowledges there is good reason to suspect claims of objectivity.

People who insist on their own objectivity protest too much they are likely to be arrogant, overconfident, or self-deceived. In fact, those who acknowledge their own biases and limitations probably have a better chance of overcoming them than those who insist they are objective. Those who have faith in the objectivity of others may be complacent or dangerously naïve. They fail to see the many obstacles – inborn and acquired, innocent and insidious, inevitable and unavoidable – on the way to truth [22, p.240].

Lichtenberg writes that to believe in objectivity is not, then, to believe that anyone *is* objective. She argues instead that as we aim to understand the world, we cannot get along without assuming both the possibility and value of objectivity.

Public Image of Journalists

Journalism is a highly public profession. This is one of the few professions in which all of one's successes and failures are presented for everyone to see. Most people can conceal the minor mistakes they make at work, but journalists do not have this luxury and

their errors are publicly available for scrutiny. Reporters are therefore often criticized for shoddy work. And they are sometimes seen as being bottom feeders freeloading on celebrities and authority figures for a good story. Unfortunately, the news media are sometimes criticized unfairly or made a scapegoat when information is reported that some people would prefer were not [23]. Yet many journalists are also applauded celebrities. They are frequently seen as successful vigilantes jockeying for the public good. The public image of the journalist is a swirl of public adoration and admonishment.

Problems with Science Journalism

Science journalism is burdened with many of the constraints of both science and journalism. This subsection will examine some of these overlaps. It will begin with a general definition of science journalism and will look at how the profession is trapped between two opposing worlds. This subsection will examine the challenges in communicating scientific uncertainty and the difficulties in covering the broad spectrum of scientific specialties. It will look at the controversial issue of journalism's reliance on official sources from the perspective of science journalism. It will address the problems science journalists tend to have with news organization gatekeepers and will examine the communication barriers inherent in this blended profession. This subsection will conclude with a look at the important role science journalists play in fulfilling their watchdog function.

What is Science Journalism?

Science journalism is a specialized form of journalism that focuses on news and features about science. While it concentrates on the subject of science, it is not itself a science, instead, it is a realm of journalism. Friedman writes that while science writing functions under the rules and constraints of both science and journalism, these domains do not have an equal impact: “science writing is a creature of the mass media, and the journalistic world has shaped science writing to its own needs” [24, p.17].

Science journalism as a fulltime occupation in North America was born between the two world wars. It grew to adolescence immediately following the second war, nurtured by the growing importance of the application of science in that war [25]. The atom bomb, the spectacular success of radar, the significance of operational research and the effectiveness of early rocket techniques as shown in the V1 and V2 weapons represented important scientific discoveries that piqued public interest in science and led to subsequent media coverage [25].

Science journalists present information to the public. They explain science and describe events to inform, educate and entertain. Robert Steinbrook, author of “Medical journals and medical reporting”, writes that journalists need to translate detailed and complicated medical papers into succinct stories that are easy to understand, yet they must provide context and balance and omit nothing that is really important. “This can be very difficult. Many articles are written against a deadline, and a comprehensive article may have to be written in an hour or two” [23, p.1669]. Like their journalist colleagues, science journalists ideally perform a watchdog function in our society and help people make informed decisions. Peter Farago, author of Science and the Media, writes that

science journalists must have “an open-eyed, realistic, perhaps even cynical commitment which does not try to hide the human, institutional, and theoretical difficulties of science and the misdemeanours of scientists” [26, p.13].

But as with most things that occupy two worlds, conflicting demands come with the territory.

Trapped Between Two Worlds

Science journalists must understand science, its language, techniques and philosophy and be able to translate it with minimum loss of meaning [27]. Science journalists must also understand the intricacies of journalism. They work within industry pressures producing newsworthy stories that are of interest to a wide audience. Friedman writes that science journalists work under a rigid set of rules and a deadly set of pressures:

A reporter has many decisions to make about a science story – what aspect to emphasize; what material needs explanation; how much research detail to present; how to translate the scientific jargon for the audience in question; how much background information to include; and, if the subject is controversial, how to achieve a balanced piece. Influencing these decisions are deadline and editorial pressures, the need for visuals, the problem of getting complex material across to a lay audience in a short article or even shorter television or radio presentation, and, perhaps, hostility or lack of cooperation from scientists [24, p.37].

Through all their work, science journalists tread a tightrope between the concerns of the public and those of the scientist, especially when there is a genuine and sincerely felt antithesis. Science journalists must gain the trust of scientists without forgetting their primary goal of informing the public [26]. Farago writes about this exceedingly difficult balancing act:

The science journalist cannot present himself [or herself] to scientists of various disciplines as an expert in science. He [or she] must instead win their confidence as the representative of another comparable profession, who has the power to collaborate but will not do harm scientifically. He [or she] must be a diplomat and a persuader in suggesting that his [or her] role in the interpretation of science is beneficial, not only to the public but also to the individual scientist [26, p.12].

Science journalists must oscillate between working with scientists and working with their media colleagues. Striking a balance between these two opposing groups can be exceedingly difficult. For example, once science journalists have a newsworthy story, their first task is not explanation, but selling, for they have to persuade colleagues and superiors that the story should be done. This takes place not only in a highly competitive atmosphere, but also in a great hurry [26].

Science journalists are also frequently accused of presenting stories with too much or too little certainty. Scientists often complain about brash news stories that make the latest research results sound final. Science journalists retort they can't address the public with the significance of findings so carefully hedged that their reality seems questionable. Journalists must produce stories that seem sufficiently significant by editors and peers to make them newsworthy. The result is a story that may appear more certain to the public than it does to scientists who read the scientific literature and have a more fully rounded picture of the research and its context [28].

Communicating Scientific Uncertainty

"Breast implants. Gulf War syndrome. Global warming. Acid rain." S. Holly Stocking writes in "How journalists deal with scientific uncertainty" that every day, journalists are bombarded with news releases and press packets from scientists, scientific journals,

scientific societies, from industry and special interest groups, all of whom have an interest in shaping public interpretations of science. Stocking explains:

Some of the materials that land on journalists' desks downplay the uncertainties of knowledge claims bearing on public choices; others do not. Some interpret findings as unqualified breakthroughs; others interpret the same findings as self-serving hype. Some claim near consensus, if not certainty, with respect to what scientists think they know; others counter by stressing the controversial nature of such claims [29, p.23].

Even when journalists are able to resist manipulation from the science community and translate science into everyday language with reasonable success, many science stories remain maddeningly hard to evaluate [30]. Science journalists must grapple with uncertain scientific results that resist interpretation, fundamental assumptions that are hidden or untested, undisclosed values that underlie important regulatory decisions, and clandestine substitution of illegitimate economic or political goals for the public interest [30]. As a result, even the most thoughtfully reported and composed stories can be a challenge to untangle. And they rarely, if ever, are able to provide the definitive answers the public is seeking [30]. Professor Dorothy Nelkin of New York University writes that journalists seeking order and certainty convey the idea that science holds the solution. "But in doing so they perpetuate a false image of science, its contributions to the resolution of risk disputes and its limits as a basis for public policy decisions" [31, p.61].

Christopher Dornan, Director of the Carleton University School of Journalism and Communication and author of "Some problems in conceptualizing the issue of 'science and the media'", writes that science is portrayed as a heroic, apolitical, and inherently rational endeavour, which has served to downplay uncertainties and legitimize the prevailing social order [32].

Covering All Those Science Specialties

Most science journalists have the added challenge of covering many fields of science. On any given day, there are potential stories in medicine, physics, chemistry, meteorology and so forth. The range of possible stories is large: the science itself, conflict, accomplishment, funding, control, ethical concerns, economic impacts and public-policy issues, to name some [33]. Just as it would be impossible for a scientist to be an expert in every scientific field, it is impossible for a science journalist to accomplish this task. And yet, science journalists are generally responsible for covering all aspects of science within their news organizations. Science journalists must therefore be incredibly well read, adaptable and good at using resources. This is, of course, not without its difficulties and science journalists rely heavily on sources.

Sources in Science Journalism

There is a constraint caused by the sheer pressure of the volume and variety of scientific events. Goodfield writes that as a result, far too much uncritical reliance is being placed on sources, “those spokespeople for science who may be self-appointed, or who by virtue of being Nobel laureates or heads of institutions may have the distinction thrust upon them” [1, p.22]. These experts may exert undue control over the types of stories covered and the information conveyed.

Gatekeepers

Although sources can have a powerful role in the press, stories must ultimately get through the gatekeepers. The people at news organizations who make these decisions

generally do not have an affinity for science. They may not understand it, much less be able to effectively evaluate it. Often editors at newspapers, for example, have a blind spot for science stories. Considering science competes with other news items for space in the paper, this means science stories often get left out. But even when science stories make the cut and are written, it is the gatekeepers who edit the work. Burkett writes:

The intended purpose of the editorial desks is to assure the accuracy of information published. However, some of the most bitter words against science news in the popular press have been hurled at work performed by headline editors and copy editors. Although these copy editors probably catch some inaccuracies, the number of complaints traceable directly to desk operations indicate the need for some deeper understanding of science news by individual editors [34, p.26].

Science journalists are confronted with many issues their journalist colleagues are unlikely to face. Communication barriers are yet another example.

Communication Barriers

In addition to the difficulties science reporters have understanding their scientist sources and getting the information past the news desk and published, science journalists have the added challenge of reporting to a largely scientifically illiterate audience. Few other journalists are faced with this type of public unawareness. A political reporter, for example, would not have to explain what a vote is in an election story. A science reporter, however, would likely need to explain what a molecule is in a story involving chemistry. Scientists also tend to use familiar terms in unfamiliar ways. For example, in everyday life the word force may be associated with movement that requires effort, such as pushing or shoving; for scientists, however, this term typically refers to Newtonian force, which has nothing to do with effort [35].

Science journalists are also faced with an array of research statistics and numbers. Publishing all of the numerical results from a study would be exceedingly cumbersome and would likely lose the reader. The science journalist must therefore pick and choose appropriate numbers to include in a story. This is where many journalists get into trouble, reporting partial results possibly misrepresenting the findings. Science journalists must have a clear understanding of the numbers involved in research to adequately report them. Science journalists must not, however, accept results at face value. They must question findings and inquire about research methods and margins of error [9].

Journalists Should Question Science

Karpf writes that medical journals tend to be seen as somehow above the fray and their findings are often accepted without question. Although they may and often do publish articles critical of medical practice and report adverse reactions to drugs, medical journals believe in the essential validity and primacy of science and according to Karpf, they hold a torch for it. In drawing stories from medical journals, journalists are also ingesting and reproducing a dominant approach to knowledge and expertise [7].

Science journalists play a crucial role. They inform and educate the public about important scientific developments. Science journalists also perform a watchdog function, questioning science. A good science reporter is a journalist first, not a scientist. While an understanding of science is essential, a scientist journalist would be unlikely to question the foundation of science in the way other journalists might.

Problems with General and Specialized Reporters

Within journalism, there are a wide variety of reporters, roughly divided into general assignment and specialized categories. This subsection will begin with a definition of general assignment and specialized reporters and will look at the pros and cons of each. It will conclude with an overview of which type of reporter is the more effective science journalist.

What is a General Versus Specialized Reporter?

A general assignment reporter covers a wide variety of stories with no particular specialization. A specialized reporter covers stories within a specific area of expertise. Because of the way science writing was born, most science writers were not trained scientists, either in the natural or social sciences, but were primarily good reporters [25]. Gans writes that specialized reporters and general reporters bring different levels of prior knowledge to their contacts with sources and enter into different relationships with them, out of which come different kinds of information [16]. There is much debate over which type of reporter is more effective in covering science stories. The next section will address some of the pros and cons of science coverage by general assignment versus specialized reporters.

Pros and Cons

Nelkin writes that journalists who know too little about science may not know how to find technical resources, they may not know what questions to ask about a complex

matter, or exactly what to make of the answers. Preoccupied with reaching a basic understanding, they have little time or energy to interpret underlying issues:

... most journalists who cover science and technology, especially those working for small-town newspapers, write about science only part of the time. And even general reporters, when covering national security, crime, trends in education, budget priorities, or health, must often touch on some scientific or technical issues. These generalists often find the science beat confusing. Afraid of technical complexity, they are apt to avoid substantive questions. And lacking both training and experience they are often unable to evaluate what they are told [31, p.94].

While greater technical sophistication is essential, too much science education may handicap a journalist. Journalists trained extensively in science may adopt the values of scientists and lose their ability to be critical [31]. The reporter could become overly sympathetic toward scientists and may produce overspecialized stories that do not meet the needs of the public. An experienced reporter without a background in science but with a generally critical eye may be more objective and can use journalistic skills to force scientists to explain things carefully [31]. Gans writes that substantive beat reporters are the only true specialists, but even they must range over wide territories. "A science reporter who is a specialist in the natural sciences becomes a generalist when assigned to a story about the social sciences" [16, p.132]. Even specialized reporters must cover stories outside their area of specialization. In effect, all reporters are on some level general assignment reporters.

Which Reporter Covers Science Best?

The ideal science reporter should sufficiently understand science to seek out appropriate resources and ask relevant in-depth questions. Journalists should be able to effectively evaluate science without being so immersed in the area of specialization that they are

unable to perform a watchdog function or simplify the content for a general audience. The ideal science journalist is likely a specialized reporter with a modest background in science. This is not to say, however, that journalists of all varieties cannot improve their capabilities. On the contrary, journalists can hone their skills no matter where they rest on the spectrum of reporting backgrounds and abilities. The guidelines that conclude this study may benefit any journalist seeking to enhance his or her reporting skills.

Conclusion

Science and journalism remain imperfect professions with many faults. While experts from each line of work tend to point fingers at the other, both specialties remain riddled with problems that impede progress. Goodfield writes:

Thus we see now how mistakes can come from both sides. They come from the scientist who inflates himself [or herself] with the authority of the “expert” and offers his [or her] data and speculations as if from on high, and from the foolish reporter who believes him [or her]. Or they come from the careless reporter who has extrapolated a statement or a scientific situation almost out of sight, aided and abetted by a scientist who may indeed be amoral, but who perhaps is only in a hurry. What has to be reconciled is the vulnerability of preliminary data of science, and its tentativeness, with the journalist’s need for speed and hard news [1, p.36].

We must not allow these unfortunate realities to dissuade us from attempting to elevate both science and journalism beyond their shortcomings. By embracing their limitations through understanding and knowledge, we can work to overcome them. This chapter offered a brief overview of some of the key problems with each profession. While there are many other issues not addressed here, it is hoped that this summary helped familiarize the reader with some of the primary concerns pertaining to science and journalism.

Chapter 3 will revisit the issues dealt with here in the context of a case study. The popular arthritis drug Celebrex is an example of a scientific discovery that received a lot of media attention. Yet Celebrex is a product of science and all scientific endeavours have areas of uncertainty. How did the media handle these uncertainties? And why did Celebrex continue to fly off store shelves amid questions and controversies?

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Chapter 3

Celebrex in the Headlines

The new arthritis drug Celebrex was the topic of a large number of Canadian newspaper articles. While the watchdog role of the media tends to encourage journalists to examine issues through a critical lens, this generally did not happen in the case of Celebrex. Reporters seemed to get caught up in the hype of the marketing messages and product positioning for the drug and often reprinted pharmaceutical company claims as unattributed facts in news copy. Journalists were perhaps vulnerable to the lack of available information about the new drug and as members of a society predisposed to medicating, they seemed to lose sight of the fact that Celebrex is above all else, a product for sale.

New drugs, like so many other creations of science, have areas of uncertainty and this was the case with Celebrex. It was backed by few published clinical trials and many speculated about the safety and efficacy of the new drug. While physicians from around the world were disputing the validity of the new medicine, Canadian news stories largely ignored the many question marks. Journalists heralded the benefits of Celebrex and reported its ever-rising sales figures. Perhaps interpreting mounting drug sales and the resulting economic gains as evidence of Celebrex's efficacy, reporters from the study newspapers across the country missed things in their news coverage and may have inadvertently contributed to the financial gains of the makers of Celebrex.

It's easy to blame the media after the fact. Plagued by very little available information, reporters were forced by competitive pressures to publish news stories about

a drug that few knew anything about and they were working on deadline under news industry pressures. This chapter will study Canadian newspaper coverage of Celebrex. It will examine published news reports about the popular new arthritis drug and will critique the work. The purpose of this analysis is not to vilify individual reporters, but to highlight areas where news coverage as a whole can be improved.

This study examined stories from December 1997, when the first report about Celebrex appeared in the sample, and November 2002. It looked at eight newspapers from across Canada: *The Chronicle-Herald* (Halifax), *The Montreal Gazette*, *La Presse*, *The Ottawa Citizen*, the *Toronto Star*, *The Globe and Mail*, *The Calgary Herald* and the *Vancouver Sun*.

The newspapers were selected to represent publications from a range of major Canadian cities. *The Chronicle-Herald* in Halifax has the distinction of being the largest family-owned newspaper in Canada and is the Atlantic region's largest newspaper. A series of CanWest Global newspapers were selected from across the country including Montreal's only English daily, the *Gazette*, as well as *The Ottawa Citizen*, *The Calgary Herald* and the *Vancouver Sun*. Transcontinental Group's *La Presse* was included to represent a francophone market. It has a circulation of approximately 300,000 primarily in Montreal and surrounding regions in Quebec. Torstar's the *Toronto Star* was also included as was Bell Globemedia's *The Globe and Mail*. The *Globe* is marketed as one of Canada's national newspapers.

News stories about Celebrex were collected through electronic database searches of Canadian News Disc, Virtual News Library and InfoGlobe-Dow Jones searches. The four CanWest Global newspapers were accessed using Canadian News Disc; *The Globe and*

Mail was accessed using an InfoGlobe-Dow Jones database and the three others were accessed using Virtual News Library. The keywords Celebrex and COX-2 were used. COX-2 is the short form for cyclooxygenase-2 inhibitor and is often used to describe Celebrex. Additional search terms such as arthritis drug, anti-inflammatory, inflammation and various other brand name and generic drugs were used during preliminary database testing, but these returned many off-topic selections. Stories that mentioned Celebrex only once or twice, but were not really about the drug were excluded. For example, a story about pharmacist mistakes that happened to name Celebrex was not included. Most business stories were also excluded, unless they discussed the product in some detail.

Occasionally, more than one newspaper published similar stories about Celebrex. For example, newswire stories about the drug were sometimes published in more than one of the study newspapers. These reports were counted individually because the study sought to evaluate how many stories were published in each individual newspaper. Moreover, these stories were edited differently for each publication and were therefore critiqued on an individual basis. Some newspapers printed a story in its entirety, others ran it as a brief and yet others expanded the piece by including files from its own reporters. Because of these often dramatic differences, it was important to evaluate the stories independently.

A total of 115 stories about Celebrex were found in the eight study newspapers. *The Globe and Mail* published 29 stories about the drug; *The Ottawa Citizen*, 18; the *Toronto Star*, 17; *The Montreal Gazette*, 14; *La Presse*, 12; *The Calgary Herald*, 11; and *The Chronicle-Herald* and the *Vancouver Sun*, seven each.

When I first proposed this study, my supervisors and some of my colleagues questioned whether or not sufficient data would be available for review. I too had doubts. Remarkably, the eight Canadian newspapers in the study sample published more than a hundred news stories about the one drug. Something about Celebrex kept the Canadian print media interested, telling its story time and time again.

This chapter will examine how the study newspapers portrayed the Celebrex debate. It will address whether or not reporting quality varied between general assignment or specialized reporters and other guest authors such as physicians. This chapter will highlight some of the main problems with the news coverage.

Although each of the newspaper articles in the study sample discussed Celebrex and COX-2 drugs, the context of the articles varied greatly. This made developing a quantitative analysis difficult. Attempts to develop such a methodology were inherently flawed by the diverse nature of the news coverage. As a result, a qualitative content analysis was selected instead. Complete references for the 115 newspaper articles can be found at the end of this thesis on page 151. They are categorized by newspaper.

Did the Study Newspapers Cover the Full Spectrum of the Celebrex Debate?

Chapter one provided an overview of the primary topics of debate about Celebrex and identified eight main areas:

1. *The Wall Street Journal* reports Celebrex is linked to deaths and cases of stomach bleeding
2. British Columbia officials debate whether or not to include Celebrex on the provincial drug plan
3. Celecoxib Long-term Arthritis Safety Study (CLASS) reports just six-months worth of data on a year-long trial

4. *Journal of the American Medical Association* article questions the role of COX-2 drugs in cardiovascular problems
5. Researchers wonder if Celebrex is linked to cases of meningitis and impaired bone mending
6. Health Canada issues an advisory warning that Celebrex users are at serious risk of developing ulcers
7. Express Scripts, one of the largest pharmacy benefit management firms in North America, conducts utilization studies that find COX-2s are prescribed inappropriately
8. Health Canada gives conditional approval for Celebrex for use in cases of familial adenomatous polyposis, a rare hereditary disease that often leads to colorectal cancer

The study newspapers varied dramatically in their Celebrex news coverage. Some, such as *The Globe and Mail*, *The Ottawa Citizen*, the *Toronto Star* and *The Montreal Gazette*, offered in-depth coverage that spanned a broader spectrum of debate than others such as *The Chronicle-Herald* or the *Vancouver Sun*. This can be explained somewhat by the number of stories covered. For example, *The Globe and Mail* published 29 stories about Celebrex whereas newspapers such as *The Chronicle-Herald* and the *Vancouver Sun* each published only seven.

But on the whole, the newspapers did a fairly good job of at least touching on the key areas of debate. Of the eight main points outlined above, the study newspapers addressed six. The missing items were Health Canada's May 2002 advisory warning that Celebrex users are at serious risk of developing ulcers, and the Express Scripts Outcomes findings that COX-2 drugs are prescribed inappropriately.

Review of the Reporting Quality of Various Reporters and Expert Authors

The articles published in the study newspapers were written by 63 authors. Of these, 31 were general assignment reporters and 15 were specialized science, health or medical reporters. Six writers were freelance reporters and the remaining 11 writers were non-journalists considered experts in the field. Experts included doctors (7), pharmacists (2), a chemist and an official from the Arthritis Society of Canada. These guest writers published editorials, commentaries and question-and-answer columns. In most cases, the articles included information about the author. When this information was missing, the newspapers were contacted for the writer's title. No significant differences were observed in the reporting quality of these various authors. General and specialized reporters, freelancers and experts all committed similar oversights when reporting about Celebrex.

Main Problems with the Newspaper Coverage of Celebrex

The newspaper articles tended to present entirely positive or negative depictions of Celebrex. The drug was considered a major breakthrough or it was said to be especially toxic. Few stories balanced these two positions. The vast majority depicted the new arthritis drug in a favourable light and the writers tended to overstate the significance of Celebrex, calling it a wonder drug and a revolutionary new product. Celebrex product claims were often repeated in news stories and many of these statements were not attributed, appearing in news copy as "facts". Many journalists reported positive testimonials about the new drug without covering bad experiences. Most articles highlighted the drug's anticipated benefits without mentioning its side effects. There were also problems with reports about the cost of Celebrex. The expensive new drug was often

said to be comparable in price to existing options. Questionable reports about new applications for Celebrex appeared in the study newspapers and journalists frequently spoke with physician consultants paid by the makers of Celebrex. These financial affiliations were made clear in only a couple of stories. The vast majority of reporters referred to physicians' professional affiliations without ever making reference to their financial ties to the makers of Celebrex. This chapter will conclude with an overview of a series of additional problems and mistakes that appeared in the news coverage of Celebrex.

Over-Zealous Reports of a Revolutionary New Drug

News stories about the introduction of COX-2 inhibitors began very early – before there was even one on the market. Among the study newspapers, the first news story about COX-2 drugs was published in *La Presse* on page C1, December 7, 1997 [1]. General assignment reporter Carole Thibadeau writes that people severely deformed or incapacitated by arthritis will soon be a reality of the past. Unfortunately, COX-2 drugs were never intended to reverse arthritic deformities or halt disease progression. This would have been known even from the very earliest days of molecule development.

On July 28, 1998, *The Ottawa Citizen* published its first Celebrex story on page B1 [2]. The headline reads, “Blessed relief: a new anti-inflammatory is being hailed as a wonder drug in the treatment of arthritis – and it’s about to be tested in Ottawa.” The overwrought headline, complete with religious overtures, presents Celebrex as a wonder drug before it has even finished being tested. Freelance medical writer Sharon Kirkey

reports the drug is “expected to be the first out of the starting gate of a revolutionary class of drugs that could be to arthritis what Viagra is to impotence.”

On August 25, 1998, *The Globe and Mail* noted Monsanto will get a faster than usual review from the U.S. FDA [3]. The news brief appears in the Report on Business section of the newspaper and quotes an unidentified company spokeswoman. The comments are printed without being questioned or even balanced by other sources. While briefs are meant to be brief, it is important that coverage reflects more than one view and clearly identifies all spokespeople.

A headline in the *Toronto Star* published April 16, 1999 states, “New arthritis drug called ‘miracle’; eases painful side effects, makers claim” [4]. On page A2, health reporter Theresa Boyle writes, “Trumpeted as the first of a new generation of arthritis medications, it was launched yesterday by Searle Canada and Pfizer Canada.” Boyle attributes these remarkably positive accounts. Others do not.

For example, the headline on a *La Presse* news brief published May 9, 1999 blares, “Arthritis: a revolutionary new medicine” [5]. The brief boasts that Celebrex offers superior efficacy with an improved side effect profile.

A front-page *Montreal Gazette* story by general assignment reporter Aaron Derfel states, “The breakthrough arthritis drug has replaced the anti-impotence pill as the fastest-selling new drug in the United States since it came on the market in January” [6]. Derfel writes, “For many of the estimated 4 million Canadians who suffer from varying degrees of arthritis, such a medication can be a godsend.”

Celebrex Product Claims Appear in News Copy as “Facts”

The U.S. Food and Drug Administration rejected pharmaceutical company requests to categorize Celebrex in a new class called COX-2 inhibitors. Instead, regulators approved Celebrex as a nonsteroidal anti-inflammatory drug. In a news release announcing the decision, the FDA stated, “Additional studies in many thousands of patients would be needed to see whether Celebrex actually causes fewer serious gastrointestinal complications than other NSAID products” [7].

About four months later, the Health Protection Branch of Health Canada also rejected requests for Celebrex to be categorized in a new class. And just as in the U.S., Celebrex was accepted for use in Canada, but was listed as a NSAID. Both countries require that Celebrex carry warning labels alerting users of the potential for serious gastrointestinal toxicity such as bleeding, ulceration and perforation of the stomach, small intestine or large intestine.

But the vast majority of newspaper articles did not address this and most made bold claims about the advantages of Celebrex. Often, these comments were not attributed and appeared in news copy as statements of fact.

Globe and Mail biotechnology reporter Leonard Zehr writes that Celebrex and Vioxx “are a new class of drugs called COX-2 inhibitors. Nicknamed ‘super-aspirin,’ they relieve arthritic inflammation without the risk of ulcers and other gastrointestinal problems” [8].

Dr. Shafiq Qaadri, a Toronto family physician, also published an article in *The Globe and Mail* [9]. He writes, “The new generation ‘super-aspirins,’ including

Celebrex, Mobicox and Vioxx, help to reduce joint and muscle inflammation – the heat, tenderness and stiffness – and are as effective as older medications, but better tolerated.”

An article published in *The Ottawa Citizen* by freelance writer Alison Korn states, “Health Canada approved COX-2 inhibitors, known by brand names Celebrex and Vioxx, which are easier on the stomach...” [10]. But in fact, Health Canada had refused to categorize Celebrex and its successor Vioxx as COX-2 inhibitors. COX-2 drugs are NSAIDs and carry all of the same warning labels, including gastrointestinal risks.

A Reuters story from Washington published in the *Toronto Star* provides a similar misleading report [11]. The article published April 21, 1999 states, “The FDA was eager to approve one of the COX-2 inhibitors because side-effects are so serious from aspirin and related drugs, known as nonsteroidal anti-inflammatory drugs. NSAIDs can cause potentially fatal stomach bleeding.” The approximately 500-word story fails to note that Celebrex is a NSAID and has the same side effect profile. The story may also lead readers to believe the FDA approved COX-2 drugs as a new class when this was not the case.

The Calgary Herald published a story by Canadian Press general assignment reporter Marlene Habib [12]. The April 16, 1999 story reports Celebrex offers an improved side effect profile and is the first arthritis drug using “advanced molecular technology.” This exact phrase appears in an April 15, 1999 Searle and Pfizer Canada news release that states Celebrex is, “Designed using advanced molecular technology...” [13].

The Calgary Herald's Medical News and Notes published April 29, 1999 states that “a revolution in pain relievers is likely to rearrange the family medicine cabinet, with a

newcomer about to muscle aside or assign different roles to the bottles of pills now on the shelf” [14]. The story reports that COX-2 inhibitors “have all the power of pain relievers – targeting fever, pain and inflammation – without any of the unpleasant side effects, such as heartburn or ulcers, associated with aspirin, ibuprofen, naproxen and other nonsteroidal anti-inflammatory drugs.”

General assignment reporter Rebecca Wigod from *The Vancouver Sun* writes, “Arthritis sufferers and their doctors are giving the thumbs-up to Celebrex, the fast-selling new anti-inflammatory drug that doesn’t cause stomach ulcers as a side effect” [15].

There were, however, a small handful of newspaper articles that attributed product claims or reflected the debate about Celebrex. In a front-page story, general assignment reporter Pamela Fayerman from the *Vancouver Sun* writes, “Celebrex is said by its marketers to be as effective as the old-fashioned drugs while having far fewer side effects – such as ulcers and gastrointestinal tract bleeding” [16]. In the *Toronto Star*, freelance writer Eric Jandciu does a good job of explaining how COX-2 drugs are actually NSAIDs [17]. He writes COX-2 inhibitors are a subcategory of NSAIDs and notes they are “claimed to be gentler on the stomach...” In an article in *The Globe and Mail*, Dr. Miriam Shuchman writes, “Studies of newer drugs, the so-called ‘super-aspirins,’ have sparked a debate that pits doctors against doctors. One side argues that new drugs such as Vioxx, Celebrex and Mobicox are safer – i.e. less likely to cause stomach problems – than older pain relievers such as ibuprofen (Advil, Motrin) and diclofenac (Voltaren). The other side claims that the new drugs are more dangerous than their predecessors in other ways – and, in any case, no more effective” [18].

Journalists Report Only Positive Testimonials About Celebrex

Journalists frequently interviewed people taking Celebrex to get their feedback about the drug. All of the patients interviewed gave Celebrex a positive review. Journalists never reported interviews with patients who had negative experiences with the drug. In only a couple of examples did reporters even make reference to the fact that Celebrex is not for everyone. For example, *Gazette* general assignment reporter Aaron Derfel writes, “Four Montreal-area pharmacists interviewed by *The Gazette* yesterday said some patients have reported little or no results with the drug” [6]. The vast majority of reporters spoke with satisfied customers. This was the case in an Associated Press story from New York. The story was published in the *Toronto Star* and *The Montreal Gazette* and did not name a writer [19, 20]. While the *Star* published the work as a brief, *The Gazette* printed a longer version of the piece that included a positive testimonial from a Celebrex clinical trial patient. The story introduces Kathryn Howe, a 51-year-old executive secretary with rheumatoid arthritis. The article states that last year her doctor asked her to test an unapproved drug. As a result of taking Celebrex, the story highlights, “She walks, swims, does low-impact aerobics and even lifts weights comfortably with no apparent side effects.” Howe is quoted as saying, “A person can shake my hand and I’m not in pain.” And, “I can hold a pencil.”

In a front-page story in *The Montreal Gazette*, health reporter Jeff Heinrich introduces rheumatoid arthritis patient Marcel Coutu [21]. The 60-year-old retired refrigeration-system salesman had taken part in Celebrex clinical trials and appeared at a company-sponsored news conference. Coutu is quoted as saying, “There was no more

pain – it was extraordinary.” A shorter version of the story was published in *The Ottawa Citizen* on page A4 [22].

The Globe and Mail and *The Calgary Herald* published a Canadian Press article that covered a similar news conference in Toronto. The story published April 16, 1999 did not name an author in the *Globe* [23], but the *Herald* listed Canadian Press general assignment reporter Marlene Habib as the writer [12]. The story introduces Canadian clinical trial patient Anne Malo who appeared at a Toronto news conference for Celebrex. The story states the 48-year-old pianist once had to give up her work because of arthritis. The article fails to mention which type of arthritis Malo has, but reports that after taking Celebrex for two years, she can return to her music. The article explains the new drug has helped her out of her wheelchair and allowed Malo to run and swim.

Toronto Star health reporter Theresa Boyle also covered the Celebrex press conference and features osteoarthritis sufferer Anne Malo in her story [4]. Boyle quotes Malo, “It’s impossible to conceptualize the impact that Celebrex has had on my life. It is certainly not an understatement to say that Celebrex gave me back my life.” Boyle writes that Malo calls Celebrex a “miracle drug”. Boyle reports that prior to taking Celebrex, Malo had tried many different drugs that offered mediocre pain relief and gastrointestinal side effects. With Celebrex, Boyle reports, “she’s able to jog between five and eight kilometres a day, swim daily and go downhill skiing with her three sons.”

It is probably dangerous for Malo to perform physical activities with the intensity described in the article. While arthritis sufferers are encouraged to exercise, it is not advisable to anesthetize pain with a drug and then overwork the affected joint [24]. It is too bad Boyle didn’t ask Malo and her doctor about this. Both were speaking publicly at

the press conference. Malo's physician is Dr. William Bensen, the lead investigator of the Canadian clinical trials for Celebrex.

When the makers of Celebrex tried to market their drug using descriptions similar to the ones employed by many reporters, the U.S. FDA objected. In a Celebrex television commercial, people with arthritis were shown successfully performing various physical activities in a park setting. They were doing Tai Chi, rowing a small boat and riding on a scooter. A voice-over sang, "Celebrate, celebrate... do what you like to do."

In a letter dated November 14, 2000, the FDA's Division of Drug Marketing, Advertising and Communications objected to the commercial [25]. The agency said the 60-second advertisement "is misleading because the totality of the images, the music, and the audio statements that you present overstate the efficacy for Celebrex." The images, the soundtrack, and both written and audio statements "collectively suggest that Celebrex is more effective than has been demonstrated by substantial evidence." The FDA requested that the companies immediately cease distribution of these "violative broadcast TV advertisements and other similar promotional materials." However, after receiving the FDA letter, the companies did not pull the ads; instead, they quickly made modifications to the commercial. They included a lyric change to "Celebrate, celebrate... come on and celebrate" and added text to the rowing scene, which stated that "individual results may vary". In addition, they made two very small editing changes. The man whizzing by on a scooter was labelled "Bill, Arthritic Knee" (instead of knees) and the woman performing Tai Chi was now "Ann, Arthritic Shoulder" (instead of shoulders). This new version of the commercial was accepted by regulators.

Additional positive testimonials routinely come from celebrities. Associated Press general assignment reporter Seth Sutel reports, “Pharmaceutical companies are increasingly turning to a tactic that gets their drugs and the conditions they treat in the news – paying celebrities to tell reporters about their own struggles with illness. The marketing campaigns produce human-interest stories that have raised some concerns about a further blurring of the line between news and commercial messages” [26-29]. Sutel describes one such campaign in which former Olympic gymnast Bart Conner was paid to discuss how he was treating his osteoarthritis with Celebrex. He writes, “Several news stories resulting from the campaign, including articles in the *New York Daily News* and *The Associated Press* and an appearance on ABC-TV’s Good Morning America, did not make clear that Conner was paid.”

The Calgary Herald and *The Ottawa Citizen* published stories for the Knight Ridder newspaper service in the U.S. about celebrities taking COX-2 drugs without mentioning whether or not these celebrities were paid to offer their testimonials [30, 31]. The *Herald* story appears under the headline, “Actress fights bone-mashing disease” and the *Citizen* headline reads, “A star’s triumph over rheumatoid arthritis: Kathleen Turner has pain-free mobility thanks to new, safe medication”. *New York Daily News* general assignment reporter Susan Ferraro wrote the story and two versions of it appeared in the *Herald* and the *Citizen*. But both stories quote Kathleen Turner saying there are new drugs “a thousand times better and a thousand times less dangerous.” Ferraro writes that Turner smiles and leaps from her chair to prove it and says, “You can fight this disease and beat it!”

Few Stories Include Side Effects

As we have seen, many of the articles from the sample emphasize Celebrex's supposed safety advantages. Most never address the drug's disadvantages and potential side effects. The following are a few examples from the minority of reporters who addressed these concerns.

Globe and Mail health reporter Krista Foss writes, "Celebrex, the new anti-inflammatory that is hugely popular among arthritis sufferers, may lead to gastrointestinal bleeding" [32]. Senior general assignment reporter Philip Lee published some of Celebrex's side effects in *The Ottawa Citizen*. He writes there were reports of "gastrointestinal hemorrhage, abdominal pain, chest pain and cerebral hemorrhage" [33]. In a front-page story, general assignment reporter Robert Walker from *The Calgary Herald* reports that although Celebrex is touted as producing less stomach bleeding than existing drugs for arthritis, some reports of major bleeding from Celebrex have emerged [34].

Problems with Reports About the Cost of Celebrex

According to the 2002 "Guidelines for the management of rheumatoid arthritis" written by an American College of Rheumatology committee, Celebrex costs as much as 15 to 20 times more per month than generic NSAIDs [35]. While these guidelines are relatively new and would not have been available to reporters publishing before this date, it is important to note that Celebrex was priced higher than other NSAIDs from Day One.

The vast majority of journalists from the study newspapers failed to report the cost of Celebrex. Of those who did, some quoted prices without putting the cost into context.

Many reported Celebrex is more expensive than other products, but a number of journalists reported the cost of Celebrex is comparable to other options.

Pharmacist Claudia McKeen published a question-and-answer feature in *The Ottawa Citizen* where she recommends Celebrex as a safe stomach alternative [36]. At no time in the article does McKeen highlight the drug's expense. *New York Times* health columnist Jane E. Brody also fails to mention the cost of new COX-2 drugs in the section of her article that reviews pharmacological options for arthritis sufferers [37]. A copy of the column appeared in *The Chronicle-Herald*.

Montreal Gazette health reporter Jeff Heinrich routinely quoted prices, but he did so without putting them into context. For example, in his April 18, 1999 story Heinrich writes Celebrex costs from \$503 to \$1,058 a year, depending on the dosage. In a later story published November 23, 2000, Heinrich writes that Celebrex costs about \$60 a month [21, 38]. In a question-and-answer feature in *La Presse* Dr. Danielle Perreault notes a 100 mg prescription of Celebrex twice a day costs \$35 a month [39]. She does not help the reader by putting this price into context and comparing it with other similar products on the market.

Canadian Press health reporter Helen Branswell writes that Celebrex is an expensive option. Her stories appeared in *The Globe and Mail* and *The Chronicle-Herald* [40, 41]. And senior general assignment reporters Andrew Duffy and Shelley Page from *The Ottawa Citizen* both address Celebrex's expensive price tag [42, 43]. Page is a former science reporter.

Globe and Mail medical reporter Carolyn Abraham writes that COX-2 drugs are estimated to be "roughly the same amount as NSAIDs" [44]. *Toronto Star* health reporter

Theresa Boyle writes, Celebrex offers “a price comparable to other brand name arthritis therapies” [4]. In stories published in *The Calgary Herald* and *The Globe and Mail*, Canadian Press general assignment reporter Marlene Habib writes that Celebrex “costs about the same as other prescription anti-inflammatories” and “is comparable in price” [12, 23].

Questionable Reports About New Applications for Celebrex

Seeking to increase their patient base and subsequent market share, pharmaceutical companies are usually looking for new ways to market existing products. Rather than risk exhausting the patient base for which a product is indicated, manufacturers look for additional markets into which to expand. Finding a new disease for a product that is already on the market is a common solution. Unfortunately, companies often make these claims prematurely, sometimes even before any research has taken place. In the case of Celebrex, the makers raised hopes their drug could be used to treat a variety of conditions involving inflammation. Newspapers from across the country covered these stories, sometimes without making clear the dubious nature of these claims.

The Globe and Mail's Abraham reports, “A new class of drugs expected to hit the market next year could eventually transform the way pain is treated. Ultimately, they may also play a role in preventing or treating certain cancers and Alzheimer’s disease” [44]. Abraham writes, “These highly stylized compounds are an early example of advanced drug design from the 20-year-old biotechnology industry.”

An Associated Press article from New York published in *The Montreal Gazette* reports the new drug is being tested for signs it might also help prevent colon cancer and

Alzheimer's disease, in which COX-2 is believed to play a role [20]. The article reports, "If it is approved for rheumatoid arthritis, the most severe joint disease, doctors would be free to prescribe it for a number of painful conditions."

The article makes no mention of the potential dangers involved in off-label prescribing. A drug's safety is evaluated based on significant research studies of its intended usage. When physicians prescribe a drug outside of its indication, they are no longer practicing evidence-based medicine and this can be extremely risky.

Journalists Failed to Report the Financial Affiliations of Sources

Medical research is deeply rooted in the market forces of industry and funding can be a powerful source of control. Specialists in the medical field receive funding from the pharmaceutical industry to conduct research and many physicians work as paid consultants for companies. In the study newspapers, these financial affiliations were rarely made clear.

In addition to working as the lead investigator of the Canadian clinical trials for Celebrex, Dr. William Bensen is an associate clinical professor at McMaster University and St. Joseph's Hospital in Hamilton. Dr. Bensen appeared as a source in five of the eight study newspapers – *The Globe and Mail*, *The Ottawa Citizen*, the *Toronto Star*, *The Calgary Herald* and *La Presse*. But at no time were his financial ties to the makers of Celebrex disclosed. Dr. Bensen received payment for his work as a lead investigator and he has also worked as a physician consultant for industry. According to Don Sancton, director of Pfizer Canada corporate affairs, Dr. Bensen currently receives ongoing funding from Pfizer.

In a Canadian Press article published in *The Calgary Herald*, Dr. Bensen is reported to have said that Celebrex doesn't have life-threatening gastrointestinal side effects and is therefore expected to drastically change treatment choices [12]. *The Globe and Mail's* Abraham quotes Dr. Bensen offering rave reviews about the new drug [44]: "It's like the cruise missile that they can program to hit the upper left part of the window pane. That's the kind of specificity it has." Abraham also quotes him as saying, "We have never been this excited about a brand new drug and the potential for what this can do."

Of the three newspapers that did not quote Dr. Bensen as a source, two spoke with other physicians who received money from pharmaceutical companies. *The Montreal Gazette* and the *Vancouver Sun* both spoke with local doctors hired by industry. *The Gazette* quotes Dr. Claire Bombardier, the lead investigator of Merck Frosst's Vioxx clinical trials without mentioning her financial affiliation with the company [38]. And the *Vancouver Sun* interviews Dr. Simon Huang the lead investigator of the Vancouver clinical trials for Celebrex [15].

Journalists also frequently contact patient organizations for information about diseases and treatments. All eight of the study newspapers contacted the Arthritis Society of Canada. The problem is that many of these organizations, including the Arthritis Society, receive funding from the pharmaceutical industry. Their position on issues may be influenced by their desire to maintain their sources of funding.

Half of the newspapers published interviews with Arthritis Society president Denis Morrice. Morrice appeared at Celebrex news conferences and was widely quoted by journalists saying things such as, "This is truly a breakthrough. Something is happening and it is quite frankly long overdue" [4] and "It's hard not to get excited" [44]. Senior

general assignment reporter Andrew Duffy quoted Morrice in *The Ottawa Citizen* as saying, “We want the doctors to have every piece of ammunition they can possibly have to treat arthritis.... You’re sending someone to war without a bloody gun if they don’t have the meds to deliver” [45]. None of these journalists reported the Arthritis Society receives funding from the makers of Celebrex and this was the case in almost every newspaper article.

Only a small minority of journalists reported this subtle form of potential bias. In one of her stories, *Vancouver Sun* general assignment reporter Rebecca Wigod mentions the Arthritis Society receives funding from industry [15]. Unfortunately, this detail was not included in a subsequent report by Wigod [46]. In a story published in *The Ottawa Citizen*, Associated Press health and medicine reporter Luran Neergaard quotes Dr. Thomas Einhorn and notes that he is a paid consultant for Merck Frosst and Pharmacia [47].

Overview of Additional Problems with the Celebrex News Coverage

Many of the news stories confused product and generic or chemical names. Some news stories talked about Celebrex while others referred to celecoxib, the drug’s chemical name. Individual newspapers were generally inconsistent in how they approached drug names. For example, in the *Toronto Star*, Celebrex stories generally used the drug’s brand name, but some stories such as a news brief published May 31, 2002, referred to celecoxib [48]. In one of *Gazette* health reporter Jeff Heinrich’s stories about Celebrex, he consistently used the drug’s brand name, but flipped to a chemical name when reporting about another drug [21]. Heinrich reported Celebrex by its brand name, but he

referred to Merck Frosst's competing product Vioxx by its chemical name rofecoxib. This problem was repeated in a similar article published in *The Ottawa Citizen* and was likely confusing for readers [22].

The newspapers from the study sample also carried U.S. based stories about Celebrex. It was often not made clear that the information provided in the articles did not apply to Canada. For example, a *Montreal Gazette* physician question and answer column about Celebrex was published before the drug was launched here [49]. The article by Chicago physician Dr. Allen Douma left readers with the impression Celebrex was not only available for use, but offered many advantages with few risks.

In an article published in *The Ottawa Citizen*, Duffy made a mistake when reporting about Celebrex's product monograph [45]. He writes, "Canadians who want to read that product monograph will not have an easy time since it remains the property of the drug company even after approval.... Ordinary Canadians who want to read it must approach the company or file an Access-to-Information request with the federal government." This is not true. The Celebrex product monograph can be freely accessed through many physicians, pharmacists or online at www.celebrex.com.

In a story about the *Journal of the American Medical Association* study assessing the potential link between COX-2 drugs and cardiovascular problems, *Toronto Star* health editor Judy Gerstel interviews one of the study authors [50]. She speaks with Cleveland Clinic cardiologist Eric Topol about the issue. He is quoted as saying, "I'm more worried now than when we published the article." Gerstel highlights Dr. Topol's concerns and quotes him as saying, "They're a good medicine. I'm not trying to malign the medicines. I'm just trying to raise potential concerns." Gerstel reports that

“meanwhile, Topol continues to take Vioxx and Celebrex on occasion when the osteoarthritis in his knees is painful.” Unfortunately, Gerstel never asks Dr. Topol why he takes two brand name products for the same affliction.

The Celebrex Case Highlights Many Concerns

While Celebrex was widely covered by the Canadian news media, much of that coverage remained inadequate and biased in favour of the drug maker. It is impossible to know how many people asked their doctors about Celebrex as a result of what they read in newspapers, but it is likely that many did so. Evelynne Michaels, editor of *Health News* at the University of Toronto Faculty of Medicine, writes, “I know for a fact – because doctors tell me – that they bring our articles and reports into their doctor’s office and use them as the basis for asking questions about their own health and healthcare” [51].

It’s easy to underestimate the harm that can occur when our stories are incomplete or incorrect or written without attention to context. People are voracious consumers of health news and information in media; but they aren’t always critical readers, mainly because they don’t always have tools to evaluate what we tell them. Based on what they read and hear, they may stop taking a drug which they need; they may change what they eat and drink, how they exercise, how they care for their children; they may purchase potentially useless or harmful products and services; they may avoid seeking medical care altogether [51, online issue 19].

Canadian newspapers largely failed to perform their watchdog role in the Celebrex case study. Reporters seemed to get caught up in the hype of the marketing messages and product positioning for the drug. They will be equally vulnerable to this in the future as well if steps are not taken to counter this predisposition. When new drugs come out, little information is available. The pharmaceutical company, which stands to profit from the product, is usually one of the few sources of information. While the public is inclined to

believe newer is better and hope surges with the announcement of any new drug, a sceptical and critical approach from the media could go a long way in improving news coverage.

Drugs are usually heavily marketed and are positioned accordingly within markets. Although Celebrex is a nonsteroidal anti-inflammatory drug similar to so many others, its makers positioned it as a safer alternative. Whether or not these assertions are true continues to be debated. Despite these uncertainties, the makers of Celebrex gave their little pills a story that fit nicely in the news and it is likely this will also be true of drugs introduced in the days to come. We will see better health and medicine news coverage when reporters stop swallowing the pharmaceutical industry's tasty, well-packaged pills.

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Chapter 4

Framed. How Big Pharma Exploit the Media

The media today represent a battleground on which political and economic interests seek to convey their views to the public [1]. Good publicity is a hot commodity and many are willing to go to great ends to secure it. This chapter will examine the relationship between corporations and the news media. It will review some of the mass communication research about what theorists call the “framing perspective” and will address how corporations attempt to shape the news according to their interests. This chapter will provide a brief overview of some the public relations and marketing strategies the pharmaceutical industry uses to gain exposure and promote the sale of prescription drugs. It will also look at how some of these strategies were implemented in the case of Celebrex. As in all areas of reporting, the news media rely heavily on expert sources when covering drugs and pharmaceutical companies. This dependence can be especially problematic in medical news reporting and this chapter will address some of these concerns. It will also look at how our society’s widely held perceptions of science and medicine can influence news coverage. There is a tendency to afford medicine a special status and this has important implications for journalists covering this area. In an effort to increase awareness and help journalists fulfill their crucial watchdog function, this chapter will present a number of key problems with medicine and the industrialization of science in general.

Framing the News

As the amount of time available for information gathering diminishes and the complexity of many issues increases, the temptation for journalists to gather their contextual information from corporate sources grows stronger [1]. Companies often contribute in important ways to informing the public about ideas, products and services. Those best organized to provide technical information in a manageable and efficiently packaged form may develop an unusually strong voice [1]. As a result, the opportunities for corporate sources to influence news frameworks and agendas are growing significantly [2]. The framing perspective in mass communication research has raised many questions about how the media frame issues or problems and how those approaches affect public understanding [3]. Shanto Iyengar, author of "Framing effects of news coverage," writes that the concept of framing refers to subtle alterations in the statement or presentation of judgment.

Converging evidence from several behavioural sciences indicates that people are exquisitely sensitive to contextual cues when they make decisions, formulate judgments, or express opinions. The manner in which a problem of choice is "framed" is a contextual cue that may profoundly influence decision outcomes [4, p.11].

Framing is a form of bias, not an ideological bias, but rather a structural bias. It is a bias that results from the selection process that takes place in the news [5]. Attempting to influence the way in which market perceptions are engineered through news coverage has become an important part of corporate activity [2]. Corporations seek to generate and sustain a reputation as a moral actor that will enhance the public reputation of the corporate product [6]. Richard Ericson, Patricia Baranek and Janet Chan, the authors of

Negotiating Control: A Study of News Sources, write the private sector tends to view the news as a promotional activity.

The news format is used in conjunction with advertising, entertainment, and public relations to convey images that have social-control effects serving the particular interests of the source. The results are measured by how many members of the public buy into the product [6, p.305].

Professor Dorothy Nelkin from New York University writes that pharmaceutical companies often try to sell their products directly through the press by publicizing new therapies as newsworthy scientific discoveries or significant medical advances:

In 1982, Lilly's arthritis drug, Oraflex, had also been marketed through science-based public relations directed at the press. The firm's public relations office sent out 6,500 press kits, promoting this new drug by making scientific claims of its effectiveness in relieving arthritis. Some experienced science reporters refused to cover the story, suspecting that Lilly's assertions were exaggerated. However, Oraflex was covered as science news by 150 newspapers and television stations, and prescriptions increased from 2,000 to 55,000 a week. When a report showed its harmful side effects, the Food and Drug Administration (FDA) intervened, and after only twelve weeks, Oraflex was withdrawn from the market [1, p.139].

Joel Lexchin, an emergency physician and an associate professor at York University and the University of Toronto, says this frequently happens [7]. Dr. Lexchin has dedicated much of his career to exploring the effect of the pharmaceutical industry on the practice of medicine and he says he does not accept research money from industry. In a telephone interview, Dr. Lexchin said drug companies exploit the news media for a variety of purposes. "They use the media to publicize their products or the disease their products are designed to treat." He emphasized pharmaceutical companies also use the media to get messages across that they wouldn't otherwise be allowed to promote. In Canada, as in the majority of industrialised nations, it is illegal to advertise prescription

drugs directly to consumers. Only the United States and New Zealand allow advertising of prescription drugs to patients [8]. Pharmaceutical companies also cannot promote a drug outside of its intended usage. For example, Pfizer Canada would not be allowed to publicly endorse Celebrex as a cancer medication prior to regulatory approval. Dr. Lexchin said, "There are no limits on what doctors, patients and the media can say. Companies work to get messages across that they wouldn't otherwise be allowed to communicate." He says the news media also lend a certain credibility to messages because advertising is perceived with more scepticism than a news story conveying those same messages.

Barbara Mintzes, a researcher for the Centre for Health Services and Policy Research at the University of British Columbia, says direct-to-consumer advertising of prescription medications has a profound effect [9]. Mintzes was one of the authors of a *British Medical Journal* study of more than 1,400 patients from Vancouver, British Columbia and Sacramento, California. They found that patient requests for medicines were a powerful driver of prescribing decisions [8]. The authors discovered that in most cases, physicians prescribed medicines requested by their patients despite their own ambivalence about the choice of treatment. Mintzes said the study represents a "disturbing trend" and a "shift of prescription only status to self diagnosis". Mintzes says she is even more concerned about what effect overly favourable news stories about particular drugs may have. "People are even more likely to respond to media reports," Mintzes said. "They seem even more credible because they appear to be coming from a neutral source."

Public Relations and Marketing Strategies

Pharmaceutical companies employ a variety of strategies to increase the sale of prescription drugs. Pharmaceutical sales representatives routinely promote their products to the medical community. In addition to informing doctors about their merchandise, sales representatives hand out drug samples for physicians to distribute. Some will give gifts for doctors' offices marked with company and drug logos. Sales representatives also supply company-produced medical journals and patient information posters and flyers about specific diseases or treatments. Pharmaceutical companies sponsor continuing medical education courses and presentations. The curriculum for these activities is designed by the company and the events are often hosted in exotic locations and may include a variety of entertainment incentives and gifts for attendees. Medical students are also targeted and provided with gifts and sponsored materials. Pharmaceutical companies recruit high-profile physicians to support their products. Often referred to as "opinion leader management", this process involves paying high-profile physicians to help promote products to other physicians. These paid consultants often appear at industry-sponsored news conferences with company supported patient groups. Most pharmaceutical companies employ public relations personnel to issue news releases and statements to the news media.

At a 1999 Medical Health Reporting Seminar at Simon Fraser University in Vancouver, medical journalist Guenther Krueger argued that pharmaceutical companies are masters of the advertorial [10]. "Selected scientific studies presented by high-ranking researchers in professional forums with carefully-invited and selected participants can provide a very subjective environment for a product." Krueger says how companies

promote their products and influence consumer and physician decision-making is a complex and controversial area. “The more you understand about the process the better you will be able to navigate through the minefields of company-sponsored bumf.”

Ray Moynihan, a medical journalist and a visiting editor of the *British Medical Journal*, says he is particularly concerned about promotional messages disguised as scientific data or impartial third party testimonials [11]. “Public debate is being secretly skewed by PR strategies.” Moynihan says companies encourage pharmaceutical solutions and tend to “dominate debate through the sheer weight of their promotional muscle.” Moynihan was one of the authors of a *New England Journal of Medicine* study that found media stories about medications tend to include inadequate or incomplete information about the benefits, risks and costs of drugs and often failed to probe the financial affiliations between study groups or experts and pharmaceutical companies [12]. Moynihan and colleagues write, “There is concern that some coverage may be inaccurate and overly enthusiastic.”

When time is short and information complex, reporters particularly tend to rely on news releases, often adopting their language as well as their content [1]. However, what journalists gain in efficiency they may lose in reliability because public relations officers tend to want to make their clients look good. They know how the press works and use this knowledge to promote the interests of the institutions that employ them [1].

These were issues I routinely came into contact with while working as a medical journalist. While it was my responsibility to develop story ideas and produce news, I was never alone in these efforts and found myself surrounded by non-journalists working to simultaneously help me and promote their products. Many story ideas went beyond study

results and news conferences and extended to the very products themselves. I found that drugs were often given “stories” of their own. Drug manufacturers gave their products an identity, a history, a type of personality. The story of each prescription drug personified the medicine’s purpose, “character” and overall image. This identity is what set the drug apart from others and highlighted who should take it and for what reasons.

Marketing strategies are developed sometimes even before the drugs themselves.

Dr. Lexchin says promoters pick the use they think will make the most money and develop clinical trials accordingly. Jeffrey Robinson makes similar assertions in his book, Prescription Games: Money, Ego, and Power Inside the Global Pharmaceutical Industry:

Drug companies view health care illness by illness, which allows them to examine the interrelated elements of any specific disease, establish a distinct pattern of cost elements unique to each illness, and then to create treatments that will, in effect, give the company a start-to-finish market. This is not about modelling R&D to fit the needs of the patient; it is about roping off territory for which particular companies stake a claim [13, p.10].

Alan Cassels, an independent health policy researcher in British Columbia, says that public relations people for pharmaceutical companies often join discussions about new drugs while the product is still at the molecule phase [14]. “They are building the story before there is even a drug,” Cassels said in a telephone interview.

Michael Decter is the former deputy minister of health in Ontario, an economist and chair of the Canadian Institute for Health Information. He says that pharmaceutical companies are often reluctant to share their public relations and marketing strategies [15]. In a telephone interview, Decter said, “Launching new drugs is a lucrative business and it is a competitive business. Many see promotional strategies as proprietary so there can be

a real barrier there. If you've got a real whiz-bang strategy to get doctors to prescribe Celebrex, you're not going to want to disclose that."

According to Canada's Research-Based Pharmaceutical Companies, all members must comply with the Code of Marketing Practices or be subjected to fines ranging from \$5,000 to \$15,000. The code covers the marketing practices of brand name prescription medicines for humans and addresses everything from advertising and information dissemination to handing out samples and paying physician consultants [16]. Pfizer is a member of Canada's Research-Based Pharmaceutical Companies. Silvie Letendre, senior manager of Pfizer corporate affairs, said the company covered all the usual public relations and marketing strategies when promoting Celebrex [17].

In an April 1999 news release, Searle and Pfizer announced that Celebrex was approved by Health Canada [18]. The news release said, "Designed using advanced molecular technology, Celebrex is clearly differentiated from traditional NSAIDs because of its innovative mechanism of action." The news release explained that scientists discovered the COX-2 and, based on that discovery, developed Celebrex, the first arthritis medication to target and block the COX-2 enzyme that plays a role in causing arthritis pain and inflammation, without blocking the COX-1 enzyme that protects the gastrointestinal system. "Previously available NSAIDs inhibit both enzymes, relieving pain and inflammation but potentially damaging the stomach lining, which led to ulcers in some patients." But a number of researchers, including the Therapeutics Initiative in British Columbia, say this is little more than company propaganda. It is likely that COX-2 isn't the only enzyme involved in inflammation and even the COX-1 enzyme may play an important role in the quest for safer drugs. And if Celebrex is indeed safer, that's not

what its product monograph says: "Serious gastrointestinal toxicity such as bleeding, ulceration and perforation of the stomach, small intestine or large intestine can occur at any time without warning..." And in a letter dated May 13, 2002, Pharmacia and Pfizer in consultation with Health Canada alerted healthcare professionals of the Celecoxib Long-term Arthritis Safety Study (CLASS) clinical trial findings [19]. They said the study indicated Celebrex offered no gastrointestinal advantages over competing medications. The letter emphasized, "No statistically significant differences were demonstrated for the incidence of complicated ulcers at the doses studied among the three treatment groups in all patients." The letter reminded healthcare professionals the contraindications for Celebrex are the same as those for other NSAIDs.

"What the companies were trying to do was to set Celebrex apart from other drugs such as ibuprofen or naproxen," Dr. Lexchin said. "They couldn't say it was any better because it wasn't, so they had to promote it as something new. By calling it a COX-2 instead of a NSAID, they made Celebrex sound newer. And newer usually means better. This is something companies do in general to make products sound unique and this was certainly the case with Celebrex."

Cassels says that it was the financial community that first dubbed Celebrex the "super-aspirin". He says pharmaceutical hype is often initiated and encouraged by market analysts. Cassels says calling Celebrex a COX-2 instead of a NSAID is like calling your new Microsoft Windows program Windows XT. You can specify if you want to, but people should understand XT is still Windows. Cassels says that many people were unclear that a COX-2 is just another NSAID and journalists covering the story shouldn't have used the term COX-2 without explaining what it is. Unfortunately, most of the

sources the journalists from the study newspapers were talking to failed to explain that COX-2s are simply NSAIDs. And if the reporters didn't realize that NSAIDs aren't new, the industry-sponsored sources weren't bringing that to their attention.

Reliance on Expert Sources

Experts may exert undue control over the types of stories covered and the information conveyed. Scientists today employ increasingly sophisticated public relations techniques to assure that their interests are represented with maximum media appeal. Their efforts to attract media attention have increased during the past decade [1]. According to Herbert J. Gans, author of Deciding What's News, the relationship between sources and journalists resembles a dance, for sources seek access to journalists, and journalists seek access to sources. "Although it takes two to tango, either sources or journalists can lead, but more often than not, sources do the leading" [20, p.116].

The means by which sources gain access to journalists, source considerations, and the relationships between reporters and their sources feed into each other to create a cumulative pattern by which journalists are repeatedly brought into contact with a limited number of the same types of sources. Eager and powerful sources which need to appear in the news first become suitable because they can always supply information, and then because they satisfy the source considerations for authoritativeness and productivity [20, p.144].

Yet the relationship between scientific sources and journalists is often strained. The communities of science and journalism approach the problem of public communication from different professional perspectives, cultural frames and political perspectives [1].

In Reflections on Science and the Media, June Goodfield describes this gap:

To say that scientists and journalists share a common aim in their respective spheres – the public expression of the truth – is, of course, to state an absolute ideal. Various constraints operating on each profession create conditions which make this highly laudable aim about as abstract as Newton's definition of a body of absolute motion. The constraints arise partly from special interests, partly from external pressures, and partly from professional ethics; these are actually so different that one can easily argue that the fundamental disparity between the environments of journalist and scientist makes the task of each coming to terms with the other well-nigh impossible [21, p.15].

Nelkin writes that science journalists present a narrow range of news coverage because they are unaggressive in their reporting and reliant on expert sources [1]. Corporate sources go to elaborate lengths to maintain secrecy and to provide media packages that will be transmitted in conduit-pipe fashion [6]. Many journalists are, in effect, retailing science and technology rather than investigating them, identifying with their sources rather than challenging them [1]. But Jean Charron, author of "Relations between journalists and public relations practitioners: cooperation, conflict and negotiation," writes that the relationship between journalists and sources is not nearly so definitive. He argues that neither partner is completely powerless before the other.

There is not a puppeteer (the public relations practitioner) on one side and a puppet (the journalist) on the other. Public relations officers succeed in exerting influence on journalists only to the extent that they yield, to a point, to the journalists' demands. They in turn, as we have seen, must be open to journalistic influence. By complying with the journalists' working requirements, and by striving to meet their needs, public relations practitioners make use of journalistic constraints for their own benefit. It is in this sense there is exchange and compromise in the relationship. The compromise must satisfy both sets of players at least minimally if the relationship is to endure [22, p.52].

Two of the most frequently interviewed sources in the newspapers studied were Dr. William Bensen, the lead investigator of the Canadian clinical trials for Celebrex, and

Denis Morrice, president of the Arthritis Society of Canada. As we have already seen, both received money from the makers of Celebrex yet frequently appeared in news stories bearing no mention of this conflict of interest.

In addition to receiving payment for his work as a lead investigator, Dr. Bensen has worked as a physician consultant for industry and currently receives ongoing funding from Pfizer. And in October 2002, Dr. Bensen's research facility received notice of a million dollar commitment from Pharmacia and Pfizer [23]. The Pfizer buyout of Pharmacia was announced in July 2002, but had not yet closed at the time of this announcement. A news release publicizing the funding states, "Our funding of the Arthritis Treatment Program gives us the opportunity to support McMaster University, which has a tremendous reputation for research excellence. The program's leader, Dr. William Bensen, works tirelessly to improve the quality of life for people with arthritis and we are proud to support him, and his team, on this educational endeavour that will benefit the Canadian arthritis community."

A story published in *La Presse* reports that Dr. Bensen was himself unable to tolerate traditional nonsteroidal anti-inflammatory drugs for his own condition and welcomes the introduction of Celebrex [24]. The story, written by Dr. Kenneth F. Walker, says Dr. Bensen believes that COX-2 drugs should be prescribed to most patients who require anti-inflammatories. He quotes Dr. Bensen as saying, "I believe we should always give patients the best of what we have."

Dr. Elizabeth Eisenhauer, director of the investigational new drug program at the National Cancer Institute of Canada clinical trials group, says lead investigators are generally very optimistic about the clinical trials they sign on with [25]. "Investigators

are by definition hopeful. They wouldn't participate in a trial if they didn't believe it was something worthwhile and exciting." Eisenhower explained that while it would be unethical for investigators to use their high hopes to bias research findings, it is common for investigators to have enthusiastic outlooks and to express those publicly. Eisenhower said, in her view, this is not as big a concern as the worrisome trend in which investigators of company-sponsored trials collect and submit information without ever reviewing the data themselves. She said with hundreds and thousands of clinical trial patients, investigators don't always have the time to go through the data, which goes directly to industry statisticians to evaluate. "Our group always holds the study databases, but that kind of academic consortium is pretty rare in medicine," Eisenhower said. "Journalists should always ask whether the investigators have had the opportunity to review the data themselves."

I contacted Dr. Bensen to ask him this question and to hear his views about lead investigators, industry-sponsored physicians and the Celebrex case in particular. I had also wanted to ask Dr. Bensen about the article in *La Presse* that claimed he takes Celebrex for his own condition and I wanted to ask him if any of his patients such as Anne Malo, featured in many newspaper articles, would be interested in discussing their experiences with me. I first started calling Dr. Bensen to request an interview in February, after my interview with representatives from Pfizer Canada. My initial telephone calls were not returned. In late February, his office instructed me that he was out of town and temporarily unavailable for comment. In March, I emailed a written request for an interview including a general outline for the discussion. I later followed up with additional telephone calls. His office asked me to forward a copy of this email to his

assistant, which I did and on April 1st, I was informed that Dr. Bensen had a case of bronchitis and would be unable to comment. I was told the subsequent work backlog would make it difficult for him to participate in a discussion in the foreseeable future.

The Arthritis Society of Canada also receives funding from pharmaceutical companies including Pfizer. The society has guidelines on accepting corporate money and a policy not to endorse specific products. The society has a \$30 million budget, of which \$1.8 million comes from the pharmaceutical industry. In addition, the Arthritis Society's website is sponsored by Pfizer and Pharmacia. Although spokespeople from the Arthritis Society appeared in all of the newspapers studied, the society's funding link to the makers of Celebrex was not disclosed in most news stories.

In 1999, the same year Celebrex was launched, author Kathleen Lewis published a book through the Arthritis Foundation in Atlanta, Georgia. The book, Celebrate Life: New Attitudes for Living with Chronic Illness, is advertised on the Arthritis Society of Canada's website [26]. The book's title is in line with Celebrex's advertising campaign, "Celebrate Celebrex."

In 2001, the Arthritis Society issued an exercise video called "Celebrate Active Living." The exercise video for arthritis patients was sponsored by Pfizer and Pharmacia. Independent health policy researcher Cassels said he has serious concerns about Denis Morrice's "shoulder-to-shoulder-with-industry position". He said, "Those cozy relationships are never made transparent and that is very troubling." Cassels explained that patient groups are very trusted even though they provide "yet another means for the pharmaceutical industry to brag about their products."

Dr. Lexchin said he has often heard arguments that patient organizations such as the Arthritis Society do not endorse individual products: "Clearly that is not true." Dr. Lexchin said many professionals do not make their financial affiliations known. "We don't bother asking and they don't bother telling."

Moynihan says he agrees. The medical journalist and editor says patient organizations can be insidiously misleading because people assume they are hearing from independent third parties when this is not necessarily the case. Moynihan said, "Sponsorships should always be revealed. I think the current situation is very unfortunate because these groups are undermining their own independence and credibility."

Denis Morrice, president of the Arthritis Society, argues, "People say, 'Oh, the Arthritis Society gets all this drug money.' Give me a break! It's less than 5 percent of our budget" [27]. Morrice says 80 percent of the Society's funding comes from individual donations, about 15 percent comes from corporate sponsors such as banks and insurance companies, and the remainder is from the pharmaceutical industry. He points out the pharmaceutical portion of the funding includes all companies with arthritis medications on the market. Morrice explained that the volunteers who serve on the Society's Board of Directors are "presidents and vice presidents of banks and major corporations. The drug companies do not serve on our board." Morrice said that while Pfizer and Pharmacia sponsored the Society's website, the companies did not write the content. And when asked about the Arthritis Foundation and Society initiatives that appeared to reverberate the "Celebrate Celebrex" marketing campaign, Morrice said "celebrate" is a common theme in arthritis. He said that while Pfizer and Pharmacia were using the term as a play on words with their product name, the Arthritis Society was using the term to encourage

patients to pursue an active life. "It's just too easy when you get a disease or major injury to end up doing nothing. It's the old spiral that goes down. What they are trying to do with 'celebrate' is an upbeat thing: let's do it, let's get on with life."

But couldn't this terminology confuse people and lead them to believe the Arthritis Society of Canada is celebrating Celebrex? Morrice said, "If one sat back and really thought about it. The subtlety is there without question. How many people get that subtlety, I don't know."

Morrice says it doesn't matter because we are missing the point. "It's like our interview now," He said. "You say, 'Does the Arthritis Society get money from the drug companies?' I think, 'Holy cripes, that is so far from what the real issue is.'" Morrice said, "The real issue is Mrs. Jones is friggin' well dying because she doesn't have access to medication and the doctor is going crazy because he doesn't have access to the medication to give his patient and we've got a bunch of bloody bureaucrats making these decisions who are not there with the patients." Morrice said he objects to how Celebrex was handled by some provinces such as British Columbia. He says it took too long to include the new drug on the provincial drug plan and it remains excessively restricted. "They wait until the person is bleeding to death and then they say, 'You can have the drug'."

Morrice maintains that Celebrex is safer than the alternatives. "The Society does not endorse any particular medication. However, Celebrex was the first COX-2 and these were labelled in all the studies as safer medications," Morrice said, rejecting concerns about Celebrex. "Here was a new generation of medication and you know what? They're making big bucks on this drug. That means all these companies are going to finally say,

‘Wow! Arthritis is important.’ They’re going to put all their top scientists into the area of arthritis where they never had any before.”

In a company news release for Celebrex, Morrice is quoted as saying, “Basically it means that Canadians suffering from arthritis no longer have to fear serious side effects of their medications. For many years that fear has been a major concern, for both patients and doctors, so this is fantastic news” [18]. Morrice was quoted in a number of other pharmaceutical industry releases as well, appeared at the Celebrex product launch and at additional news conferences for the new drug. Morrice said he is not overly concerned about individual complaints that the Arthritis Society is a cloaked arm of the pharmaceutical industry. “We just do what we do. I truly believe that if you are doing the right things, at the end of the day, it all comes out. People see it.”

Don Sancton, director of Pfizer corporate affairs, says his company has a number of relationships with patient societies because they share many common goals, such as disease awareness and getting people to seek appropriate treatment [28]. He said, “The societies are incredibly careful to safeguard their independence and we are too. It is not in either of our interests for any society to be compromised in that way.” Sancton says in the absence of government money for the societies, Pfizer is just trying to do its part.

Colleague Silvie Letendre said, “As a leading pharma company, we think we have a responsibility to Canadians and that is why we give over \$9 million to 600 non-profit groups across Canada” [17]. She says some of them are related to areas where they have products, but many are not. “We feel it is our duty to help educate patients in those areas.” Letendre says she is frustrated by critics: “It is very easy to bash what the private

sector is doing, but if you remove that funding, who will do it? I like how they can criticize, but then what solution can they provide?”

Patients are another important source of information journalists often turn to. Many of the articles published in the study newspapers quoted patients from the Celebrex clinical trials. While this is considered standard practice, it is important to note that clinical trial patients are not entirely unbiased sources of information. Their doctors are usually the trial’s lead investigator, the person who likely recruited them for the study. While clinical trial patients are generally not paid for participating in studies, their expenses are sometimes covered and they receive any medications free of charge for the duration of the trial and often afterward as well. Patients who go on to speak at news conferences after the study are generally recruited by their doctor. Those patients tend to be reimbursed for expenses and receive a briefing prior to the news conference. Sancton says some patients are invited to travel a day or two early so that Pfizer can shoot video of their comments to offer to television crews. In such cases, Pfizer would cover any additional expenses. Sancton said he couldn’t recall the expenses for the Celebrex press conferences, but that Pfizer complied with standard practice. Sancton said, “Patients like the idea that they are in some way contributing to the advancement of science or the treatment of a disease like arthritis.” He says many have lived with the devastating effects of arthritis for years. “If they can do that little bit to help the research so that maybe a few years down the line somebody else doesn’t have to suffer as much as they have, I think that is a big attraction for people. Just the same as giving \$5 to the Arthritis Society.”

Celebrex clinical trial patient Anne Malo is reported to have worn a button-front suit and delicate jewellery to a press conference announcing the drug’s upcoming launch

[29]. Many arthritis patients would be unable to dress themselves in such intricate garments. Malo is quoted as saying, "It's altered my life and lifestyle a thousand-fold."

Cassels says he believes patients are paid by pharmaceutical companies to offer glowing testimonials of their products. "At the very least, they are trained and supported to become patient spokespeople. And many of them sound as though they are reading from a script. They probably are."

Why Do We Afford Medicine A Special Status?

Science remains idealized as an esoteric activity, a separate culture, a profession apart from and above other human endeavours. This is a convenient image, serving the interest of scientists seeking status and autonomy [1]. The fact that journalists resent manipulation by public relations officers and over-eager scientists does not diminish that influence – especially when sensitivity to manipulation is dulled by persistent faith in science as the ultimate, authoritative source of objective information [1]. British journalist and sociologist Anne Karpf writes that science is uniquely privileged compared with all other kinds of human knowledge:

Mostly, we think of science as bypassing the social, political, economic, and emotional conduits through which other human thought and ideas (literature; history; economic; myth; dogma; religion; art; etc.) flow. Science has a hotline to nature, uncontaminated by individual point of view or self-interest. The objects of scientific study, the material world, are reckoned to have a stability independent of the person or people perceiving them. Science is thought with the thinkers removed, discoveries just waiting to be discovered [30, p.128].

Karpf writes that medicine came to share science's privileged status, but it wasn't always so. In the eighteenth century, the wealthy patient was the dominant figure in the doctor–

patient relationship. The patient defined his or her own needs and how those needs would be met. With the growth of hospitals, which enabled the patient's body to be examined using new equipment, the doctor gained ascendancy, becoming the dominant partner in the relationship [30]. Karpf writes that "when the State intervened to regulate the doctor-patient relationship, it did so to maintain the already considerable rights of doctors" [30, p.131]. She adds:

If the medical profession's status as authoritative expert is relatively novel, most doctors would insist this reflects the relatively recent growth of medical knowledge and its curing capabilities. In other words, the virtual monopoly which the medical profession enjoys over treatment is in direct ratio to its skill. But while the growth of medical skills is clearly a factor in the increased public acceptance of medicine, the story of how the medical profession won its privileged status isn't simply a stirring tale of technical achievement. Medicine worked hard to become dominant and autonomous... [30, p.131].

Moynihan says that as a society, we do tend to afford medicine a special status. "Too often journalists suspend their critical judgement if someone has an MD after his or her name. Medical establishment is riven with conflicts of interest and we always have to ask and we always have to disclose," Moynihan said. "There is something about medicine that gets us all starry eyed. Perhaps it is ingrained in deeply held beliefs to have faith and trust in medicine."

Problems with Industry

The world's leading pharmaceutical companies have an economic power base equal to or greater than that of some countries [31]. This industry is unique. That's partially because there is a certain inevitability about prescription medicines. Many go through life without soft drinks, jeans, or televisions, but just about everybody, at some point, needs

medication. Sometimes, life depends on it [13]. Linda. Marsa, author of Prescription for Profits: How the Pharmaceutical Industry Bankrolled the Unholy Marriage Between Science and Business, writes science is now so steeped in business that research is governed by the whims of the marketplace, not by good science [32]. The World Health Organization maintains that “there is an inherent conflict of interest between the legitimate business goals of manufacturers and the social, medical and economic needs of providers and the public to select and use drugs in the most rational way” [33, p.7].

Dr. Lexchin says the key problem with our current system is the popular belief that there is nothing wrong with the market and what the market decides is best. He says there is something wrong with the market: “The motivation for industry is private profit and that does not necessarily coincide with public values.” Dr. Lexchin says he is concerned about how little information is available about the drugs on the market. “For so many products, there isn’t a lot of information available and what is available is partial,” he said. “We see a lot of short-term trials for drugs to be taken long term. We see drugs tested against placebos instead of competing drugs and trials that look at biochemical changes rather than disease outcomes.” Dr. Lexchin says that Celebrex was allowed in the Canadian marketplace based on very little data. “There wasn’t a lot of information available about Celebrex and this is the case with a lot of new drugs,” Dr. Lexchin said.

Agreeing with the Therapeutics Initiative’s complaints about a lack of published clinical trials, Cassels said there was hardly any published data about Celebrex. He says that while physicians claimed to be prescribing the new arthritis drug based on the data, there were hardly any available, doctors were likely basing their prescribing on

marketing. “And this is the case with other drugs as well. The Celebrex case is not unique,” Cassels said.

Decter echoed these concerns, “I worry that we have drugs we’ve used for a long time that we really don’t know that much about.” Decter says that drugs are tested on specific grounds to be permitted to enter the market and are later used more widely. He says there is a tendency for new products to displace old. “Do we have a system that ensures people get appropriate prescriptions?” Decter worries the answer to that question is no. “It will be a big job to improve prescribing.”

Moynihan says this big job must be taken on. “Countries like Canada cannot continue to squander public funds on cost ineffective treatments,” he said. “The roar of marketers routinely encourage drugs be used in cost ineffective ways. The Celebrex case is a perfect example because it was such a scandal. Celebrex is cost effective only for particular cohorts of patients.”

Provincial formularies across the country seem to reflect this view and most approved the drug for coverage under specific conditions. It was noted that Celebrex should be prescribed only after other nonsteroidal anti-inflammatory drugs are unsuccessful. While this clause was designed to limit the drug’s use, physicians are not required to comply with formulary stipulations and Celebrex continued to be prescribed in record numbers even though it costs significantly more per month than generic NSAIDs [34].

“Reporting about drugs almost always glosses over the more unsavoury aspects of industry – those things companies don’t want to talk about such as conflicts of interest,” Cassels said. “Conflicts of interest in medicine are profound and they are almost never

exposed.” He says that when companies are forced to make decisions between the bottom line and ensuring public health, the bottom line almost always wins out. Cassels said, “Too often, companies do the very minimum they need to do to get drugs licensed.”

Anne Tomalin, the president of CanReg, a regulatory affairs consulting firm, published an article called “A quick trip to the market: ten simple steps to hasten approval times for new drugs in Canada.” The article appeared in a pharmaceutical trade magazine and she writes:

Gaining market access is key to the life of a pharmaceutical company. Knowing how to do it well, and get approvals quickly, is a strong competitive advantage. Faster approvals mean longer patent life and longer market access without competing with a generic product [35, p.27].

In the final pages of his book, Robinson asks, “Should any of us fully trust – as we are asked to do – any corporation with our health when that same corporation is fast to remind its shareholders where its true allegiance lies?” [13, p.218]

If the recklessness of people in this industry were mirrored in, say, the airline business, we would surely stop flying. If the dishonesty – or at least the reliance on quasi-truths – of some people in this industry were mirrored in the financial sector, we would not entrust our money there. If the greed of some people in this industry were mirrored in our elected officials, what little respect politicians can still command would evaporate. No, the pharmaceutical industry is not like any other. Because we cannot stop taking medication, we are asked to tolerate recklessness in the name of progress, to accept dishonesty in the name of research and development, and to turn a blind eye to greed in the name of shareholder satisfaction. We are also faced with the sad truth that there is no indication, anywhere, that things will get any better [13, p.216].

Whether or not the pharmaceutical industry is significantly more questionable in its practices than other industries, journalists play a crucial role. They inform and educate the public about important scientific developments. Navigating through the culture of

health and medicine, journalists have an essential watchdog function. They must therefore become more critical consumers of medical and scientific data. High quality news coverage of the pharmaceutical industry and the products they make is vital. Reporters must understand the culture of science and medicine to effectively report about them. The guidelines in the following chapter offer a simple and cost effective tool for journalists seeking to improve medical news coverage.

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Chapter 5

Guidelines for Journalists Covering Medical News

This study has highlighted a number of problems with Canadian newspaper coverage of medical news. The Celebrex case study demonstrated a number of key concerns with how the press deal with these types of stories. Medical news has gained enormous popularity in recent years, partly because the population has been aging, with the baby-boomer generation well into middle age and confronting all the health concerns that come with it. For these and many other reasons, medical news has become increasingly popular [1]. As Warren Burkett, author of News Reporting: Science, Medicine, and High Technology, put it, “medicine is money.”

Nowhere else are threads of scientific enterprise more tangled with economic, political, personality, and social values than in medicine and the related health sciences [2, p.100].

While science and journalism have many problems, there is much that individual journalists can do to elevate their reporting. Most journalists would agree that reporting science is “nightmarishly formidable” at times and yet is vitally important [3, p.179]. In Selling Science: How the Press Covers Science and Technology, Dorothy Nelkin emphasizes the crucial role of reporters:

For most people, the reality of science is what they read in the press. They understand science less through direct experience or past education than through the filter of journalistic language and imagery. The media are their only contact with what is going on in rapidly changing scientific and technical fields, as well as a major source of information about the implications of these changes for their lives. Good reporting can enhance the public’s ability to evaluate science policy issues and the individual’s ability to make rational personal choices; poor reporting can mislead and disempower a public that is

increasingly affected by science and technology and by decisions determined by technical expertise [4, p.2].

This chapter will provide a series of guidelines to help journalists avoid these problems. These directives emerged from my experience as a medical journalist, from literature about science writing and from the shortcomings observed in the news coverage of Celebrex. The guidelines for covering medical news are designed to help journalists fulfill their essential function. They are intended to assist reporters navigating through the culture of health and medicine. Armed with vital information about how the health industry operates, journalists should be able to report about it more effectively. These guidelines should help journalists become more critical consumers of scientific data and should help them improve news coverage in simple and cost-effective ways.

Guidelines

1. Read scientific literature about the subject being covered.
2. Avoid words like “breakthrough” or “miracle” to describe new drugs or medical procedures.
3. Use the product name for a drug because people are more likely to recognize it. But list its generic or chemical name at least once.
4. Report study limitations. In many cases, researchers publish at least some of them. Read critically to find more and ask others.
5. Determine the manufacturer’s marketing claims and product positioning.
6. Read the product monograph.
7. Include details of side effects.
8. Report how the cost of a new treatment compares to existing options.

9. Be sceptical of announcements that a particular medical treatment can also be used for additional purposes.
10. Report the financial affiliations of every source, especially those of physicians and patient organizations.
11. Be wary of patient claims, particularly those made by celebrities.
12. Verify international sources of information against Canadian health regulations.
13. Take special care when including numbers.
14. Verify scientific and medical claims and provide broad analysis of implications.
15. If the story could serve as an advertisement, return to guideline 1 and go through the list again.

Guideline 1

Read scientific literature about the subject being covered.

It is important journalists conduct background research for the topic being reported.

This may seem obvious, but all too often journalists rely exclusively on sources without first doing some background reading. Running into an interview blind prevents reporters from asking probing questions and leaves them open to manipulation. The press is habitually limited by time and resources, which render extensive research of specific areas of expertise impractical. Exhaustive study would be inadvisable anyway considering the most effective reporters are those with a basic understanding of the subject matter and a generally critical eye. Journalists who are experts in areas outside of reporting may be unable to adequately explain the issues to a general audience. They may also be excessively sympathetic and unable to perform their watchdog function. While reporters must not be exceedingly specialized, they must not be ignorant of the subject

either and should therefore have a decent foundation. In the case of medical news, this can be accomplished by reading the scientific literature and monitoring conventions.

While newspapers generally have limited literature resources, reporters can supplement available reading with online material. For example, a keyword search on PubMed, a free Medline search engine on the internet, can provide a wealth of information. Key papers written about a wide variety of subjects are likely to be found. The website is: <http://www4.ncbi.nlm.nih.gov/PubMed>. Identify some of the main authors, major issues and points of contention. To be prepared, journalists should sufficiently understand the topic to seek out appropriate resources and ask relevant in-depth questions, which will allow them to effectively evaluate the issues and simplify them for readers.

But while reviewing this material, it is important to bear in mind that medical journals have many problems of their own that should be considered. Medical journals, like all publications, have their own preconceptions and attitudes. For example, medical journals are notoriously unfriendly to positive studies of alternative medicine [5]. Yet despite their biases, medical journals are highly regarded, their articles often accepted as fact. While scientific literature should be read in preparation for interviews, it is important to read that information with an open mind and an understanding of its inherent flaws.

Guideline 2

Avoid words like “breakthrough” or “miracle” to describe new drugs or medical procedures.

Reports of wonder drugs and miracle cures are entirely too pervasive. Very few of these so-called miracle products ever live up to their promises. Medical journalist Guenther Krueger argues against using terms such as “breakthrough”:

It seems that everything these days is groundbreaking and innovative. Some of it may be, but the vast majority of research moves knowledge forward incrementally. The “Salk vaccine” days – when one important discovery could literally wipe out a disease entity – are long gone. Because new knowledge and understanding happens slowly and unevenly, the projected path of actual clinical application is also bumpy and somewhat unpredictable. So, even though editors and the public may demand simple solutions, the journalist should resist giving them unless there is very clear evidence to the contrary [6, online issue 19].

Announcing medical breakthroughs is, not surprisingly, a way for companies to increase the sale of commercial products and journalists all too often get caught up in the hype [4]. Clinical trials test new products on a sample of the population. Even the largest trials cannot possibly predict how a new drug will react in every person. Drugs are almost by definition poisons and it is widely accepted that a certain number of people will die as a result of any new product [5]. Often, the benefits are perceived to outweigh the risks and new treatments are made available for wider testing and public consumption. Emphasizing a new drug’s miracle status in light of these unfortunate realities is inaccurate and perhaps even a little perverse.

According to Anne Karpf, author of Doctoring the Media: The Reporting of Health and Medicine, new medical technologies are hardly ever subjected to media scrutiny, especially if they come with a medical seal of approval. She writes that reporting

breakthroughs and medical triumphs suggests that today's illnesses will be vanquished tomorrow [5].

The miracle cure is the chief vehicle for the medical approach with medical research reduced to a few select, glorious results, their origin and process erased. It restimulates a belief that as the experts become more expert, they'll find technological solutions for even the most intractable medical problems. The miracle cure denies uncertainty and death; it hymns rational expertise, suggesting that everything is knowable and conquerable. While moral panics unite us in opposition to a dreaded group or condition, miracle cures bind us in optimism that the system is progressing, and each of us stands to gain [5, p.140].

But in reality, the concept of a medical breakthrough is a troubling one because this term is too often used to describe a treatment that may, at best, offer limited results [1]. Nelkin writes that reporters tend to play into the public's desire for quick fixes.

Just as high technology is a "solution" to international competition, so medical technologies are "solutions" to problems of physical health, mental illness, or infertility. As we have seen, this style of reporting reflects the pressures from aggressive sources of information, as well as current fashions and editorial perceptions of what readers want to hear. Journalists respond to the interests of academic, industrial, and research institutions eager to promote the latest technologies and therapeutic techniques. But there is a counterside to these promotional tendencies, for exaggerated promises that dovetail with prevailing hopes or beliefs open the way to disillusionment, should they falter. The result is the tendency toward polarized reporting so evident in the coverage of technological risks [4, p.45].

Burkett writes that stories promoting new drugs give journalists many bad moments. Too often the drugs prove disappointing or unexpectedly dangerous after stories have been written from data provided by drug manufacturers and government agencies [2].

One of the traps of science and medical writing has been to attach too much meaning too soon to a scientific discovery. In medicine, it produces false illusions of "cures" before there is a track record of disease remission. Stories of scientific "breakthroughs" often ignore the many steps between one or a hundred successful laboratory

experiments and endlessly repeated production runs of a medicine or a new device [2, p.5].

Burkett also cautions against mistaking treatments aimed at the disease itself and those aimed at alleviating symptoms. He explains that journalists sometimes overlook this important distinction. Treatments of the common cold, for example, relieve symptoms but do not attack the viruses that cause them [2]. In Science and the Mass Media, Hillier Krieghbaum wrote that physicians rightly complain that too many newspaper reports, especially on new drugs, have ballyhooed medical findings as cures for some fairly common disease. He explained that cancer research frequently has been a ground for such reporting and noted that hundreds of chemo-therapists tell of a deluge of plaintive letters requesting the “miracle cure” after the mass media have reported on a medical convention paper or article. And yet, Krieghbaum conceded the public has the “right to know” about such research, especially if its money is being used to finance it [3, p.163].

So how can journalists avoid raising false hopes while fulfilling their crucial information role? By avoiding the typical formula for stories about new medical treatments. I call this reporting style “break journalism” – breakthrough, breakdown, break away. When a new medical treatment makes the news, it is generally in the form of a major breakthrough. A few months later, the story usually shifts to breakdown – the treatment is having adverse effects and many questions are raised. And finally, the treatment is no longer newsworthy and reporters break away, no longer covering it. The media bat readers back and forth from biotechnology miracles to visions of apocalypse, from celebrations of progress to warnings of peril, from optimism to doubt [4].

By keeping away from words like “breakthrough” and “miracle”, reporters avoid these starkly positive or negative news stories and will be able to offer more perspective

and balance. This will also protect journalists from inadvertently making false advertising claims on behalf of the company that manufactures the new product. Burkett writes about the corporate world:

Companies, often led by U.S. firms, turn out many useful new products. Most cause little, if any, disturbance in the market place or in society other than profits. Yet the potential for nationwide and even worldwide good and harm goes with each product because of the rapid and efficient marketing and distribution systems of modern business. Sometimes effects cannot be foreseen... Sometimes effects are already known, and ignored, when they are negative. Business managers have been known to suppress adverse data (including fatalities) about products, attempt to use political influence to win scientific and governmental endorsement of spurious products, and to obtain dismissal of court decisions assessing company liability for death and injury. A known level of risk may be accepted as merely the cost of doing business [2, p.93].

It is also important to note that not all “new” products are necessarily new. Only a small fraction of provincial drug budgets are spent on honest-to-goodness advances. Instead, new drugs classified as offering moderate, little or no improvement over existing medicines account for the largest share of pharmaceutical spending in Canada [7]. Pharmaceutical companies are notorious for promoting slight variations on existing drugs [2]. Health Canada approves an infinitesimally small number of treatments it would categorize as truly innovative. The vast majority of new medications are me-too drugs and chances are, the latest one journalists are covering is too. They can find out by checking in which category the drug was approved. Category 1 drugs are those that provide a substantial improvement over existing medicines. Category 2 medicines offer a promising alternative and Category 3 drugs provide moderate, little or no improvement over existing medicines. Health Canada classified Celebrex in Category 3. It was approved as a nonsteroidal anti-inflammatory agent and not as a cyclooxygenase-2

inhibitor as the manufacturer promoted. The classification makes a big difference in defining what the drug does and in justifying whether or not it is something new or just another me-too. While it is possible Health Canada may misclassify a drug, this system offers reporters useful insights.

Another way to check whether or not a drug is new is through its generic name. For example, Prozac is a popular anti-depressant with the chemical name fluoxetine. Eli-Lilly is currently promoting Sarafem, a product for women who suffer from what the manufacturers call premenstrual dysphoric disorder (PMDD). The symptoms of PMDD sound remarkably similar to depression and much like Prozac, which is commonly prescribed for depression, Sarafem's chemical name is fluoxetine. They are exactly the same chemical. A news story promoting Sarafem as a breakthrough for women would be highly inappropriate.

Guideline 3

Use the product name for a drug because people are more likely to recognize it. But list its generic or chemical name at least once.

A drug's generic or chemical name can provide a wealth of information and journalists will need this information to locate reports about a new drug, but when it comes time to publish, the product name will help people recognize it. News organizations are too frequently inconsistent in this regard, often using product names for positive stories and generic names for negative ones. This tends to be the result of the sources of the stories. Pharmaceutical companies are generally eager to report positive findings about their brand-name drugs. Medical journals, which customarily publish chemical names, tend to be the sources of more negative data. While generic and chemical names are more

accurate and help move reporting away from promotion, the reality is that people generally recognize drugs by their advertised names. Publishing a news story about a drug using only its generic name would likely have little impact on readers who may not even recognize the product. Many people taking Celebrex may not be aware they are on celecoxib and people on Prozac or Sarafem may not know they are taking fluoxetine. Use a drug's product name in news reports, but list its generic or chemical name at least once to provide readers with potentially useful information.

Guideline 4

Report study limitations. In many cases, researchers publish at least some of them. Read critically to find more and ask others.

Nonscientists may look at research findings as indisputable facts. Many believe that scientific inquiry is reliable to the point that we need only comprehend the results. This image of science perpetuates several convenient myths: that science can provide definitive answers, that "facts" speak for themselves rather than being open to interpretation and that decisions about socially acceptable risks are scientific rather than political judgments [4]. In reality, the most common outcome of the scientific process is not facts, but uncertainty. Scientific expertise is not so much the accumulation of knowledge as the skill of recognizing and managing uncertainty [8]. The acknowledgement and management of uncertainty is one hallmark of good science. It is arguably the mark of good science and medical journalism as well. Research can be flawed and study results may be lacking when put into context. Journalists must therefore explain study limitations when reporting research findings. In many cases, the reporter's job is simplified by the researchers who tend to publish at least some of their work's

shortcomings. Read critically to find additional limitations and ask others for their perspective on the study. Research can be derailed by an infinite number of factors, but here are some key points to watch for.

- study design – can a study of this kind yield the required answer?
- study size – larger studies tend to have more credibility (i.e. statistical power)
- repeatability – studies must have the potential to be replicated to confirm their validity
- sampling bias – how was the study sample selected? And is the sample applicable? The findings of a study of university students may not apply to an older, more diverse group
- confounding variables – are there other factors that could account for the finding? The results of a study showing Japanese students are more intelligent because they get better grades could be refuted. Study habits would be an example of a confounding variable that should be taken into account
- study location – studies conducted outside of Canada may have been carried out under significantly different health and safety standards
- adequate controls – ideally, studies should include a group that is held constant for comparison and investigators and patients should be blinded to avoid bias. For example, neither group should know who is receiving the test medication and who is receiving a placebo
- randomized – were the participants divided by some random method?
- all the results – support for a hypothesis may appear stronger when results are selectively excluded
- error rates – what is the probability of inaccuracies? Studies are imperfect and most statistical analyses will include information about the likely rates of error

Due to the nature of scientific inquiry, there is always some degree of uncertainty in scientific findings [9]. In “Using systematic thinking to choose and evaluate evidence,”

Robert J. Griffin writes that if the audience's world is in fact uncertain, a good journalist accurately points that out. "For example, the results of pre-election political polls and other sample surveys of the public are couched in sampling error. A journalist who reports such a survey accurately and responsibly will always take into account the survey's margin of error when interpreting the poll for the audience" [9, p.226]. The same standards should be applied to reporting scientific study findings.

Stephen Klaidman, author of Health in the Headlines: The Stories Behind the Stories, writes that reporting medical news is rarely simple and straightforward.

It requires considerable inventiveness on the part of journalists to convert sometimes mind-numbing, confusing material into compelling, readable stories. This alchemy can result in exaggeration of risks or of scientific progress, it can promote overemphasis of emotional or political elements of essentially technical or scientific stories, and it can result in inaccuracies and important omissions. Nevertheless, the rewards of transmuting base science into journalistic gold can be a powerful incentive for reporters and editors [10, p.20].

But studies on media coverage of science and medicine indicate that many reports fall short of journalistic gold. S. Holly Stocking, author of "How journalists deal with scientific uncertainty," writes that the bulk of the existing work on science news suggests journalists make scientific claims appear more solid and certain than they are [11]. By not including a scientist's qualifying statements and conditional clauses, reporters often make findings appear more positive than the researcher believes them to be. Stocking points out that a small body of research has found the opposite can happen as well. Journalists sometimes make scientific claims appear more uncertain and baffling than most scientists believe them to be.

Indeed, the very certainty of individual accounts of science, when followed in rapid succession by equally certain but contradictory accounts, may be expected to exaggerate uncertainty on occasion, as

when today's apparently certain study on the nutritional value of butter appears to contradict yesterday's study on its nutritional dangers. This amplification of uncertainty may be particularly acute when such inconsistencies are presented without explanation [11, p.28].

A good science news story should help audiences learn to test or question scientific findings [8]. Ideally, it feeds an audience's appetite for increasingly better explanations by giving people some basis for questioning or considering study results — rather than frustrating them with unsupported claims that warrant only blind faith or unreflective cynicism [8].

Guideline 5

Determine the manufacturer's marketing claims and product positioning.

When reporting about new medical treatments, journalists must be aware of the manufacturer's marketing claims and product positioning. Without this basic understanding, it will be difficult to avoid reproducing the product's often-pervasive promotional strategies. Marketing claims and product positioning can be collected from news releases, product websites, advertising and the manufacturers themselves. How does the company set their product apart from others? What does the manufacturer report is new or special about this drug or procedure? Who is the product designed for and what niche does it fill? In the case of Celebrex, the makers set their drug in its own class, which they called COX-2 inhibitors. They heralded the drug as a safe-stomach alternative to other arthritis medications currently available on the market. Celebrex's product website boasts that Celebrex is different because it blocks only the inflammation and pain-producing COX-2 enzyme [12]. And Celebrex ads made similar claims; a popular 1999 print ad appearing in medical journals read, "The first anti-inflammatory to target

only COX-2. Celebrate Power. Celebrate Living.” Reporters from the newspapers in this study consistently published these marketing claims as statements of fact in their news stories and provided the makers of Celebrex with invaluable unpaid advertising.

Marketing claims tend to fit nicely into news stories because they generally answer the who, what, where, when, why and how come questions. A clear understanding of this phenomenon and how marketers are trying to sell their wares will help journalists offer readers more balanced coverage of new treatments.

Guideline 6

Read the product monograph.

Once reporters have a clear understanding of the manufacturer’s marketing claims and product positioning, they should read the product monograph for the new treatment. A product monograph is a regulatory document developed by the manufacturer and approved by Health Canada. The product monograph is among the end results of a drug review and provides a wealth of information about any new treatment. In many cases, manufacturers are forced to publish information they would prefer not to. Much of what appears in the product monograph never makes it into news releases or advertising.

Product monographs are the fine print and they are generally tedious reads. Perhaps this is why so many people avoid them. Journalists can access product monographs online, from the manufacturer, in a reference book known as the Compendium of Pharmaceuticals and Specialties, from pharmacists or from physicians. In the product monograph, reporters can read at length about a new treatment’s contraindications, side effects and warnings. The Celebrex product monograph is as monotonous as most. It states, “Celebrex (celecoxib) is chemically designated as 4-[5-(4-methylphenyl)-3-

(trifluoromethyl)-1H-pyrazol-1-yl] benzenesulfonamide and is a diaryl-substituted pyrazole.” Not the most compelling read, but it is in this monograph that the makers concede “Celebrex is a nonsteroidal anti-inflammatory drug”. They also tell the reader, “Serious gastrointestinal toxicity such as bleeding, ulceration and perforation of the stomach, small intestine or large intestine can occur at any time without warning...” The product monograph will help journalists get around the marketing campaign and promotion strategies of products and learn more about their potential dangers. While product monographs are produced by manufacturers and are therefore still somewhat biased, they offer compelling insights into the regulatory process and will provide important information that might otherwise be difficult to find.

Guideline 7

Include details of side effects.

Many news reports present new treatments without ever identifying the side effects or possible dangers. The product monograph will help journalists identify and report side effects and contraindications. News of the latest trends in medicine tend to highlight how the treatment is designed to perform without making clear the disadvantages of the technology. Our generally positive attitudes about medicine as an agent of healing can deceive us into overlooking the reality that drugs are chemicals that go into and affect the body in both favourable and unfavourable ways. Readers deserve the whole story in all its optimistic and menacing detail. Karpf writes that news reports tend to focus on deaths or side effects from a particular drug, as if they're individual “rogue drugs” and the others are implicitly safe [5, p.28]. She calls for a more balanced depiction in reporting.

In the Celebrex case study, very few journalists reported the side effects of the drug even though it is plagued by a long list of very serious potential consequences. As listed in the Celebrex product monograph, these include gastrointestinal and renal effects, a low red blood cell count, fluid retention, swelling and hypertension. Had the reporters from the study newspapers reported Celebrex's side effects, they may have questioned the manufacturer about its claims that Celebrex is the safe stomach alternative. Side effects are an important part of new medical treatments and need to be included in news reports.

Guideline 8

Report how the cost of a new treatment compares to existing options.

Due to the proliferation of me-too drugs, it is more important than ever to report the cost of new treatments. These slight variations of the original tend to be priced significantly higher and offer few, if any, advantages to people who could benefit just as much from cheaper, equally effective medicines. The price of new drugs is a crucial element of any new treatment story that should not be overlooked. When asking for cost estimations, journalists should verify any quotes they might receive from the manufacturer. A promoter's definition of relative expense might be significantly different from that of consumers.

Provincial drug plans can provide insights into the cost considerations of new treatments. When new drugs are approved for provincial drug plan funding, restrictions are often placed on them. Prescribing ceilings can tell journalists a lot about how a new treatment is perceived by regulators. In the case of Celebrex, most provinces agreed the new arthritis drug should be prescribed only after other nonsteroidal anti-inflammatory drugs are unsuccessful. While this clause was designed to limit the drug's use, physicians

are not required to comply with stipulations and Celebrex continued to be prescribed in record numbers. Most reporters in the study newspapers never referred to this clause, despite the fact that many of them published stories about formulary approval. This information is available through provincial ministries of health and some of the provinces even publish it on their website.

Rising healthcare cost is a significant issue and each new treatment will weave into this intricate mosaic, inspiring many ethical and financial considerations. A system drowning in demand cannot afford to buy the same old drugs with flashy new names and fat price tags. Costly me-too drugs should only be tried when cheaper alternatives prove unsatisfactory. It is a disservice to readers to merely announce new treatment options. Such stories must be accompanied by explanations of how a new medical product fits in the range of existing options and how these alternatives compare both physiologically and financially.

Guideline 9

Be sceptical of announcements that a particular medical treatment can also be used for additional purposes.

Proclamations abound that existing medical treatments can be extended to other uses.

Seeking to increase their patient base and subsequent market share, companies are usually looking for new ways to market their wares. Rather than risk exhausting the patient foothold for which a product is indicated, manufacturers look for additional markets into which to expand. Finding a new disease for a product that is already on the market is a convenient solution. Unfortunately, it is common for companies to make these claims prematurely, sometimes even before any research has taken place. In the

case of Celebrex, for example, the makers raised hopes their drug could be used to treat a variety of other conditions involving inflammation. Journalists reported these claims and many stories about the role of Celebrex in the treatment of cancer and Alzheimer's disease appeared in the sample newspapers. Trudy Lieberman, a contributing editor to the *Columbia Journalism Review*, writes that journalists often fall victim to powerful public relations machines representing some very big money. "Reporting a product or technology not yet proven clinically effective generates sales for manufacturers and stimulates momentum that is hard to reverse." Lieberman writes, "In the name of news and the desire to build audience, the media are stimulating demand for medical tests and treatments that are unproven and untested and may even be harmful" [13, p.24]. Reporters should hesitate before publishing a story of this kind. Ideally, reports of this nature should not be entertained until at least some evidence is collected to corroborate the speculation. But if for competitive reasons the issue must be reported right away, journalists should make sure the dubious nature of such claims are emphasized.

Every so often individual physicians will begin prescribing specific medications for conditions outside of a drug's intended use. This practice is not recommended, but remains legal and these decisions are left to the discretion of individual physicians. A doctor who opts to make this controversial decision may do so with the best of intentions. This does not, however, undermine the seriousness of this volatile course of action. A drug's safety is evaluated based on studies of its intended usage. When doctors tread outside of a drug's indication, they are no longer practicing evidence-based medicine and therefore take a risk. Journalists reporting a story of this nature should make sure they

emphasize the hazards involved. Most physicians would agree the best treatment options are those based on significant research that substantiates safety and efficacy.

Guideline 10

Report every source's financial affiliations, especially those of physicians and patient organizations.

Medical research is deeply rooted in the market forces of industry and funding can be a powerful source of control. According to Krueger, evaluating sources for reliability has always been the hallmark of a good journalist [14]. He argues that in science and medical writing, it is becoming an even more important skill to hone. Journalists should therefore report every source's financial affiliations, especially those of physicians.

When I first addressed this concept during a presentation to my colleagues at the School of Journalism and Communication, one student exclaimed, "But doctors are the good guys!" And indeed our society affords medicine and its practitioners a special status. Ray Moynihan and Melissa Sweet address this issue in their article, "Medicine, the media and monetary interests: the need for transparency and professionalism."

The goodwill of researchers and opinion leaders is a particularly valuable commodity precisely because it can be exploited by a company using the media to promote a new product direct to the public. Having a new product endorsed in newspapers or on television by a purportedly independent authority figure is invaluable [15, p.633].

And individual scientists have indeed been known to use their credentials to market products [4]. Conflicts of interest, primarily financial ties to manufacturers and sellers of technology, are pervasive in the medical industry [13]. Journalists eager to quote an expert, or someone who appears to be an expert, don't routinely inquire about those conflicts [13].

The results are stories like the ones we saw about Celebrex. The vast majority of reporters attributed sweepingly positive statements about the new arthritis drug to physicians such as Dr. William Bensen, the lead investigator of the clinical trials and a consultant for the makers of Celebrex. Journalists must ask every doctor they interview about his or her financial affiliations to the manufacturer of any medical treatment being reported. Journalists can back up these inquiries by plugging the physician's name into PubMed, a free Medline search engine, to see what kinds of research he or she has been involved with in the past. This research may offer insights into which companies have been funding the physician's work.

Patient organizations are often perceived as impartial sources of information. Journalists will frequently interview these organizations in lieu of individual patients. These organizations are asked to speak on behalf of those they represent. The problem is that many of these same organizations receive funding from the private sector, including pharmaceutical companies. Their position on issues may be influenced by their desire to maintain their sources of funding. In the Celebrex case study, the reporters routinely turned to the Arthritis Society of Canada, an organization that receives five percent of its budget from the pharmaceutical industry, including the makers of Celebrex. This subtle form of potential bias can be overcome by disclosing every source's financial affiliations and conflicts of interest.

Guideline 11**Be wary of patient claims, particularly those made by celebrities.**

Eyewitnesses are unreliable in courts of law and their accounts in medical reporting are no exception. Sometimes people see what they want to see and sometimes high hopes really can make a difference. The placebo effect is a case in point.

Patients can also be paid consultants for private industry. Claims made by celebrities are especially suspect because pharmaceutical companies are increasingly hiring stars to help them get their products in the news. Paying celebrities to tell reporters about their own struggles with illness helps produce human-interest stories that afford invaluable promotion opportunities. Journalists should think twice before reproducing patient claims and they must not forget to inquire about and investigate their financial affiliations as well.

Guideline 12**Verify international sources of information against Canadian health regulations.**

While many news stories are international, this is not necessarily the case with medical news. Health and safety standards can vary dramatically from country to country and even product names can change from one jurisdiction to another. According to Pfizer Canada, Celebrex carries the same name around the world, but this is not always the case and dramatic differences can often be found between even North American countries. For example, AstraZeneca's heartburn medication with the chemical name omeprazole is called Prilosec in the U.S. and Losec in Canada.

News organizations often pick up health stories from across the border without taking these important details into account. We saw examples of this in the case of

Celebrex; many of the newspapers studied carried stories about the arthritis drug before it was available for use in this country. The stories failed to make this important fact known and Canadian readers were left with the impression that Celebrex was readily available for use.

Guideline 13

Take special care when including numbers.

Numbers can help put issues into perspective and quantifying assertions are a key component of many news stories. Although health and medicine provide many exciting stories, the biostatistics that scientists must use in their studies present special problems for reporters [16]. Statistics can produce results that are disturbingly counterintuitive, at least at first [16]. And unfortunately, the media have responded in kind by providing a wealth of examples of how not to report and display scientific and statistical information [9].

During my undergraduate studies, I can remember many of my journalism colleagues joking they were embarking on a career in journalism because they were so poor in math. But numbers are an important part of journalism and basic math should not be thrown by the wayside while copy is haphazardly peppered with figures. Many stories present numbers without putting them into perspective. Usually, a number standing alone does not convey a lot of meaning. It has to be compared with another number or even string of numbers before much sense can be made of it [17]. A statistic reporting that the incidence of heart disease is increasing in Canadian cities every year may seem alarming, but could be insignificant if the populations of those same cities are increasing at the same pace. Rates that fail to include a denominator are meaningless; baselines provide a

context for any raw statistic [9]. And no percentage makes sense unless one knows its base.

Irrelevant comparisons are among the common failings of news stories. When comparisons are made, care must be taken that the numbers are being evaluated on an apples-to-apples basis [17]. For example, it would be inappropriate to compare the rate of arthritis in one city with the number of people being treated for arthritis in another. The rate of disease incidence and the number of people being treated are two separate measures that should not be compared. All too often, journalists use a raw figure to jump to a conclusion. More reported cases of a disease are not always the same thing as more cases [18]. Disease reporting may be improving while the actual rate of disease may remain the same. Many reporters also confuse causation and correlation. Relations can be found between two things without one necessarily leading to the other. A correlation and a cause are entirely different things. Stocking highlights this in an example:

If reporters understand that correlation does not equal causation, they will know, when they see a study reporting a correlation between ear infections and pacifiers that they should not jump to the conclusion that pacifier use causes ear infections; it may simply be the case that children who get ear infections find some relief in using pacifiers [11, p. 31].

In A Mathematician reads the Newspaper, John Allen Paulos writes that the set of standard questions journalists ask should be expanded. He writes these questions should include, "How many? How likely? What fraction? How does the quantity compare with other quantities? What is its rate of growth, and how does that compare?" [19, p.201] He adds that journalists have a responsibility to find out more information about the numbers sources cite.

If statistics are presented, how were they obtained? How confident can we be of them? Were they derived from a random sample or from a

collection of anecdotes? Does the correlation suggest a causal relationship, or is it merely a coincidence? And do we understand how the people and various pieces of an organization reported upon are connected? What is known about the dynamics of the whole system? Are they stable or do they seem sensitive to tiny perturbations? Are there other ways to tally any figures presented? Do such figures measure what they purport to measure? Is the precision recounted meaningful? [19, p.201]

Statistics can be a powerful source of distortion so journalists should make sure they check their numbers.

Guideline 14

Verify scientific and medical claims and provide broad analysis of implications.

Entirely too many medical news stories offer inadequate, superficial coverage. June Goodfield, author of Reflections on Science and the Media, suggests a potential remedy. She writes that at least some science writers must become more like responsible political commentators, adding analysis, judgement and criticism to their reporting [20]. Nelkin points out that while art, theatre, music and literature are routinely subjected to criticism, science and technology are almost always spared – until outrageous incidents occur. She writes that while political writers aim to analyze and criticize, science writers seek to clarify and explain [4].

Journalists, for their part, must try to convey understanding as well as information. It is not enough merely to react to scientific events, translating and elucidating them for popular consumption. To comprehend science or technology, readers need to know its context: the social, political, and economic implications of scientific activities, the nature of evidence underlying decisions, and the limits – as well as the power – of science as applied to human affairs [4, p.171].

Michael Smith, a past president of the Canadian Science Writers' Association, argues, "It is not enough to apply the usual standards of balance – quote Greenpeace, quote

Monsanto – and let it go at that” [21, online issue 20]. He says journalists must dig deeply and work very hard to generate an accurate picture of both the risks and the benefits of any new technology. “We live in a world where science and the products of science play an increasing role,” Smith said in an address that was later published in Science Link, the association’s newsletter. “Our readers, listeners, and viewers can only make sense of their world if we present an accurate and detailed picture of the science that shapes it.”

Science writer Marcel C. LaFollette argues that in most cases, modern science journalism fails not because it is biased for or against science but because it covers the social structure and social implications of science inadequately or incompletely. “We need far more emphasis on how scientific research is conducted and on what can be realistically expected from conventional research techniques and standards. Research projects can be described in ways that dispel myths and inform policy debates, but most often they are not” [22, p.181]. Reporters could improve this situation by verifying scientific and medical claims and providing broad analysis of implications. Krieghbaum suggested that if journalists were to pay more attention, not only to research and development but also to science’s role in the national economy and in government, new assignments in econo-science and politico-science coverage could be expanded [3].

Guideline 15

If the story could serve as an advertisement, return to guideline 1 and go through the list again.

This last guideline isn’t meant to be facetious. Journalists should read through their copy to check if promoters could use what is written in their marketing campaign. If they can,

chances are, the coverage is superficial and missing key points. Journalists ought to return to guideline 1 and go through the list again because important elements of the story have likely been overlooked. There were examples of this in the Celebrex case study. *Globe and Mail* medical reporter Carolyn Abraham's lead about the new arthritis drug reads, "Not long into the new millennium your medicine cabinet promises to be a very different place" [23]. This could be a line from an ad. In a question and answer column in *The Ottawa Citizen*, pharmacist Claudia McKeen writes, "Celebrex is different. It is classified as an anti-inflammatory analgesic agent and is the first of a new and improved class of drugs..." [24]. Advertising medications directly to consumers remains illegal in Canada. It is important journalists ensure that news coverage does not circumvent these laws.

Conclusion

Celebrex's whirlwind debut on the market and continued popularity despite significant concerns raises many important questions. This study focused on Canadian newspaper coverage of Celebrex and evaluated how the media handled this story. On the whole, the newspapers did a reasonably good job of at least touching on the key areas of debate. But they did a poor job of handling the uncertainties that accompany the introduction of any new product and they widely failed to reflect the deliberations about Celebrex's safety and efficacy occurring in much of the medical community. The study newspapers largely heralded the launch of the product and celebrated its rise to blockbuster status. The reporters appeared to buy into Celebrex's marketing hype and reproduced much of it in their news stories.

These guidelines are designed to help journalists triumph over these difficulties and improve news coverage. While science and journalism are hindered by many faults, individual journalists have a responsibility to work toward elevating their reporting beyond them. Immersed in a society predisposed to seeking quick fixes and widely in awe of medicine, journalists should not automatically buy into claims that purport to carry a scientific stamp of approval. They must not get caught up in the allure of the white lab coat and should always question. Scientific and medical claims must be investigated and verified, not passively accepted, translated and explained. Katherine E. Rowan, author of "Effective explanation of uncertain and complex science," writes that science is a puzzle-solving process designed to produce better explanations of reality. "When journalists report science news, they should help audiences participate in this puzzle-solving by reporting some of the reasoning that supports or questions the findings" [25, p.205]. Griffin concurs and summarizes some of the key skills journalists must continue to develop:

Journalists in the 21st century must be able to reason from verbal and quantitative information, know how to assess what information is missing, be able to gather and validate the required information, be adept at understanding and explaining the uncertainty that scientific information inevitably contains, and be able to interpret information to nonexpert audiences verbally, quantitatively, graphically and, most of all, accurately. These cognitive and communication skills are absolutely essential if journalists are to meet their responsibilities to society and their audiences in the new millennium [9, p.246].

These guidelines are designed to help journalists fulfill their essential function. The recommendations take current limitations of the news business into account and offer simple and cost-effective suggestions. They were developed to assist reporters in understanding the culture of science and medicine to become more critical consumers of

scientific and medical data. These guidelines offer an important tool for journalists seeking to improve medical news coverage.

The Next Celebrex

At the end of 2002, Health Canada approved Bextra, a new anti-inflammatory for rheumatoid arthritis, osteoarthritis and menstrual cramps. Pfizer Canada held off announcing the product launch until after the holidays. In January 2003, the company issued a news release publicizing the drug [26]. Bextra's chemical name is valdecoxib and much like its sister, celecoxib or Celebrex, the drug is being marketed as a safe stomach alternative. Bextra's product monograph carries a similar warning that "Serious [gastrointestinal toxicity], such as peptic ulceration, perforation and bleeding, sometimes severe and occasionally fatal, can occur at any time, with or without warning symptoms..." But unlike Celebrex, which is often prescribed twice daily, Bextra is taken once a day in line with competitor Merck Frosst's Vioxx. According to the U.S. Food and Drug Administration and Health Canada, Bextra has already been linked to some rare but life-threatening skin diseases.

Dr. William Bensen was the lead investigator of the Canadian clinical trials and Denis Morrice, president of the Arthritis Society of Canada, says he wholeheartedly supports the launch of the new product. "Bextra is a brand new drug that is even better. It is doing more for pain and it's going to do even more for inflammation," Morrice said in an interview [27]. Jean-Michel Halfon, president and CEO of Pfizer Canada, is quoted in the company news release as saying, "Bextra raises the bar in effectively treating the debilitating symptoms of arthritis." Unfortunately, it also raises the bar on price.

Bextra is a little more expensive than Celebrex, which already costs as much as 15 to 20 times more per month than generic anti-inflammatories [28].

This story has only just begun. How will journalists do this time?

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