



SCRIPT DOCTOR: MEDICINE IN THE MEDIA

Fact-checking Fiction

By Andrew Holtz, MPH

A young doctor and an older man step through the buzzing activity of a hospital emergency department. The older man sits on the edge of an empty bed and the doctor pulls up a chair. The doctor quizzes his patient, trying to figure out why he had a bad reaction to his medication. It turns out the man had switched drugs on his own, using some leftover pills from a friend. Taken aback, the doctor asks the man why he would risk his health by taking someone else's medicine.

"I've got no insurance. You know how much these drugs cost?"

Then they get up and do it again. And again.

Having an on-set medical adviser is one of the ways medical shows work to assure accuracy.



Andrew Holtz, MPH, is a former CNN Medical Correspondent and the author of "The Medical Science of House, M.D." This column examines mass media programs, particularly entertainment TV, for insight into popular perceptions, so that rather than merely wincing at distortions or oversimplifications in the portrayals of medicine on these shows, health care professionals can learn something from media professionals about the way that medical and health topics are presented.

Send questions to him about how the media treat medical topics or suggestions for future columns about a

particular show or topic to discuss to OT@lwwny.com

This isn't an ER; it's the set of *ER*, the elder statesman of primetime medical dramas. Each movement, each word of the "doctor" and his "patient" are scripted by writers, and then played out in front of the cameras and crew squeezed between the ER beds and nurses station. But just behind the camera, alongside the director, there's a chair for someone who wouldn't be on the sets of most other TV shows.

The occupant of that chair is an MD. He is listening to the pronunciation of medical jargon and watching to

see that the right equipment is used at the right time in the right way. Having an on-set medical adviser is one of the ways medical shows work to assure accuracy.

At *ER*, MDs have always been in the mix. One of the first writers was Neal Baer, MD, who eventually rose to become an executive producer of the show. Dr. Baer introduced other physicians to Hollywood, including his medical school friend David Foster, MD.

Dr. Foster worked with *ER* and other shows, while continuing to prac-

tice medicine. But then he became a full-time writer on the staff of *House*. He also sits in on the filming of many of the medical scenes, but it is a nurse who has the lead role in monitoring accuracy on the *House* set.

"She is the one who is there for all the medical scenes. She makes sure they are holding the scalpel correctly, or a patient is draped correctly, or people are wearing gowns when they should be wearing gowns, or that when they are in x-ray that they are wearing protective lead aprons, that type of thing," Dr. Foster said.

It's ironic that a nurse is the primary on-set medical adviser for *House*. The show has been criticized by nurses for often portraying them as little more than housekeepers and rarely showing nurses providing direct medical care.

In each scene, it is not only the actions and words of the actors that must be checked for medical accuracy; bedside monitors, screens, x-rays, and other images added to the visual flavor of a show can also introduce errors.

If the actors are talking about a suspicious mass on a lobe of a patient's lung, then the image they are huddled

NSCLC

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who constituted a very small minority of enrollees, the data are far shakier, Dr. Langer said.

"As of 2006, we have observed a clear-cut benefit for adjuvant cisplatin-based therapy, particularly in Stage II and Stage III NSCLC. In one primary trial—CALGB 9633—devoted to Stage IB NSCLC and in subset analyses of other, larger trials that included Stage IB as well as earlier stages, the evidence for benefit in Stage IB NSCLC is not compelling. This general reservation is amplified by the LACE meta-analysis.

"Under these circumstances, it may be necessary to repeat controlled, randomized trials in Stage IB NSCLC comparing standard chemotherapy to observation. Finally, advanced age is not an impediment to standard adjuvant therapy in fit individuals."

Some Dismiss Role of Adjuvant Carboplatin

"A lot of my colleagues have taken great delight in looking at these data and dismissing the role of carboplatin in the adjuvant setting," Dr. Langer said.

"I would argue that we need to exercise some degree of caution. There are several inconvenient truths regarding CALGB 9633. The three-year disease-free survival still favors adjuvant treatment, as does three-year overall survival. There is a nine percent absolute difference in recurrence and death rates. Median follow-up is still under five years, and I would argue, too, that this is probably the second premature reporting of this trial. While 150 deaths were needed for analysis, only 131 deaths have occurred."

Carboplatin-based therapies do offer advantages, though, he said: "The best results obtained in Stage IB have been attained with carboplatin-paclitaxel, not cisplatin. The subset analysis in four-cm tumors still demonstrates a survival benefit. This has not been tested in Stage IIB-III in the adjuvant setting, so the absence of data does not prove absence of benefit. And finally, a substantial percentage of adjuvant patients are poor candidates for cisplatin-based therapy because of age and various comorbidities."

Clinically, statistically significant overall survival benefits have been observed with platinum doublets in Stage II-III disease overall in three to four cycles, he said, noting that Stage IB treatment still needs to be individual-

ized: "For now, in fit patients, most of us would recommend cisplatin-based doublets. Despite a median age of 59 to 62 in trials, older patients often benefit. Preoperative adjuvant chemotherapy is still being investigated," he said.

The next Intergroup trial (the Eastern Cooperative Oncology Group 1505 study) in early-stage NSCLC will take bevacizumab, which has shown a benefit in advanced disease, and look at that in combination with chemotherapy versus chemotherapy alone, he said.

'Premature to Criticize Trials of Carboplatin

Asked for his opinion, A. Philippe Chahinian, MD, Professor of Medical Oncology at Mount Sinai School of Medicine in New York City, said, "I agree that carboplatin is not dead. It is premature to criticize trials of carboplatin.

"If you look at Stage IIIB or IV disease, carboplatin does as well as cisplatin, or the difference is extremely small. Based on results in advanced stages of disease, carboplatin is not inferior to cisplatin."

The CALGB trial is important because it was specifically designed for Stage IB disease, Dr. Chahinian said.

The next Intergroup trial in early-stage NSCLC (ECOG 1505 study) will take bevacizumab, which has shown a benefit in advanced disease, and look at that in combination with chemotherapy versus chemotherapy alone.

"The results are underpowered because there were only 170 patients per arm, which is well below expected because early results were positive.

"The differences in disease-free survival were very large. The three-year survival is still significant. More importantly, for the largest tumors, there was a significant favor in overall survival in the paclitaxel group."

CALGB is still a positive trial, he said, and deserves to be confirmed with an appropriately powered trial with larger numbers of patients and compared with cisplatin and vinorelbine in an adjuvant setting.

around better have a shadow in that area, or viewer complaints are sure to follow. These medical images usually come from real patients, with any identifying information stripped off or altered.

"There are a number of places that provide de-identified x-rays and other images," Dr. Foster says. "For the general things, say you need a chest x-ray, there a number of prop houses in Los Angeles that have that sort of thing; a normal head CT scan or something like that. When we are looking for something particular, say an angiogram of an aorta that's not quite so common, we will often go to medical centers and ask their department of radiology if they have that type of image that they could provide for us."

Neal Baer, who helped lead Dr. Foster from the exam room to the writers' room, is now executive producer of *Law & Order: Special Victims Unit*. But his departure from *ER* did not leave that show doctor-less. Emergency medicine specialist Joe Sachs, MD, has been involved with the show for over a decade. Pediatrician Lisa Zwerling, MD, has been writing for *ER* for four years.

"Human drama is the point of all the steps taken by entertainment TV shows to ensure medical accuracy. When it's done right, then the story rings true."

"Joe Sachs and I still do shifts," Dr. Zwerling says. "And so sometimes we will have a story that is really moving to us. We will change all the details so that the real-life person would never identify themselves on screen. Also, we have colleagues who will call us up and give us a great story."

Those colleagues include two medical consultants who are full-time emergency medicine physicians.

Dr. Sachs says the non-MD writers lean on them for stories that are not only medically accurate, but support their primary objective: telling good stories. For example, when one of the primary characters on *ER*, Dr. Abby Lockhart, played by Maura Tierney, returns from maternity leave, she is nervous about her ability to jump back into emergency medicine.

"So that is when the medical assignment comes in: What is something truly amazing and incredible that Abby can do on her first day back, that you've never seen before on *ER* after 13 seasons! So that's when everybody looks at me and says, 'OK, what's Abby gonna do?' At that point, I have to go to the well of our medical database," Dr. Sachs says.

The well includes his and Dr.

Zwerling's professional experiences and reading, including 20 or so medical journals each month, but also stories gleaned from focus groups and panels of physicians and patients, and material culled from newspapers, magazines, and elsewhere by a full-time researcher.

Hollywood, Health & Society Program at USC

When writers at *ER* and other medical shows need a specific medical question answered, they'll turn to specialists, including those suggested by the

"Hollywood, Health & Society" (HH&S) Program at the Norman Lear Center at the USC Annenberg School for Communication in Los Angeles.

The program was created by the Centers for Disease Control and Prevention and is now also funded by the National Cancer Institute and other federal health agencies.

ER called on HH&S after reading about paired kidney exchange programs, for example. In these programs, a patient who has a willing donor who is not a match is connected with an appropriate patient-donor pair, so that

both patients receive kidneys. The writers wanted to explore a conflict between two physician characters on the show about some of the ethical challenges that might arise with such organ donation match-making.

"To really get all the lowdown on paired organ exchange programs, HH&S put [Dr. Zwerling] in touch with Dr. Jim Burdick, who is the head of the Johns Hopkins paired exchange program," Dr. Sachs says.

Over the past year, HH&S has responded to more than 200 inquiries (continued on page 54)

HIGHEST LEVEL RECOMMENDATION

ONCE SALIVARY FUNCTION IS LOST YOUR PATIENT MAY FEEL STRANDED

Ethyol
 AMIFOSTINE
 for injection

*Protection for Your Mouth
 Prescription for Tumor Care*

The American Society of Clinical Oncology (ASCO) Clinical Practice Guidelines recommend that Ethyol use be considered to decrease the incidence of acute and late xerostomia in patients who undergo radiotherapy for head and neck cancer, giving the level 1 grade A recommendation.

There is no urgent need for prophylaxis during head and neck cancer therapy.

Protect *you* *and* *your* *patients* *before* *it's* *too* *late*.

Approved Indication: Ethyol (amifostine) is indicated to reduce the incidence of moderate to severe xerostomia in patients undergoing postoperative radiation treatment for head and neck cancer, where the radiation port includes a substantial portion of the parotid gland.

Safety Information: Headache, nausea, and vomiting occur frequently after Ethyol is given and may be severe. In a multicenter, placebo-controlled trial, the most common side effects with Ethyol were nausea/vomiting (28%) and hypotension (17%). In a phase II multicenter trial, the most common side effects with Ethyol were nausea/vomiting (28%) and hypotension (17%). Diarrhea, epistaxis, and other side effects have also been commonly reported during clinical trials and are generally self-limiting.

It is recommended that midazolam be administered prior to and in conjunction with Ethyol. Oral SHT, receptor antagonists, alone or in combination with other medications, have been used effectively in the multicenter setting. In the phase II setting, it is recommended that midazolam be administered intravenously 30 mg IV and a serotonin SHT, receptor antagonist, be administered prior to and in conjunction with Ethyol. All listed medications may be required based on the clinical setting being administered.

Patients who are hypotensive or dehydrated should not receive Ethyol. Patients should be adequately hydrated prior to receiving Ethyol. When Ethyol is administered with highly emetogenic chemotherapy, the oral intake of the patient should be carefully monitored. Patients who are taking antiemetic therapy that cannot be stopped for 24 hours preceding Ethyol administration should not receive Ethyol at doses recommended for antiemetic therapy. Blood pressure should be monitored during treatment. Serum amifostine levels should be monitored in patients at risk for hypotension.

Algebraic relationships including respiratory and severe adverse reactions have been reported rarely with Ethyol administration. Ethyol should be permanently discontinued for severe or severe adverse reactions, or for any adverse reaction not resolved with other appropriate therapy. Patients should be carefully monitored prior to, during, and after Ethyol administration.

Ethyol is contraindicated in patients with known sensitivity to any of the components.

Warnings: See also appropriate drug interactions of Ethyol. See also Ethyol (amifostine) 100 mg/mL injection, USP.

Level 1 type of evidence is grade of 1A, Grade A for recommendation is grade of A-D, Level 1: Strongest evidence for benefit and/or harm, well designed, controlled trials, with randomization, with low bias, and with high quality. Grade 1B, Grade 2, Grade 3, Grade 4, Grade 5, Grade 6, Grade 7, Grade 8, Grade 9, Grade 10, Grade 11, Grade 12, Grade 13, Grade 14, Grade 15, Grade 16, Grade 17, Grade 18, Grade 19, Grade 20, Grade 21, Grade 22, Grade 23, Grade 24, Grade 25, Grade 26, Grade 27, Grade 28, Grade 29, Grade 30, Grade 31, Grade 32, Grade 33, Grade 34, Grade 35, Grade 36, Grade 37, Grade 38, Grade 39, Grade 40, Grade 41, Grade 42, Grade 43, Grade 44, Grade 45, Grade 46, Grade 47, Grade 48, Grade 49, Grade 50, Grade 51, Grade 52, Grade 53, Grade 54, Grade 55, Grade 56, Grade 57, Grade 58, Grade 59, Grade 60, Grade 61, Grade 62, Grade 63, Grade 64, Grade 65, Grade 66, Grade 67, Grade 68, Grade 69, Grade 70, Grade 71, Grade 72, Grade 73, Grade 74, Grade 75, Grade 76, Grade 77, Grade 78, Grade 79, Grade 80, Grade 81, Grade 82, Grade 83, Grade 84, Grade 85, Grade 86, Grade 87, Grade 88, Grade 89, Grade 90, Grade 91, Grade 92, Grade 93, Grade 94, Grade 95, Grade 96, Grade 97, Grade 98, Grade 99, Grade 100.

References: 1. Hershkovitz H, Gendron D, Miller G, et al. For the American Society of Clinical Oncology. Chemotherapy and Radiotherapy. Ethyol 100 mg/mL injection for the use of chemotherapy and radiotherapy. Clinical Practice Guidelines of the American Society of Clinical Oncology. J Clin Oncol. 2005;23(27):5533-5542. 2. Gendron D, Hershkovitz H, Miller G, et al. For the American Society of Clinical Oncology. Chemotherapy and Radiotherapy. Ethyol 100 mg/mL injection for the use of chemotherapy and radiotherapy. Clinical Practice Guidelines of the American Society of Clinical Oncology. J Clin Oncol. 2005;23(27):5533-5542.

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ScriptDoctor

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from TV writers and researchers at nine broadcast and cable networks. And they've connected the staff at those entertainment programs to about 150 experts at the CDC, NCI, and other agencies, medical centers, and organizations.

HH&S also makes house calls, meeting with writers and producers to introduce health topics and new information that may both inform and enter-

tain viewers. A visit to the ER writers' room will be featured in a future column.

"HH&S briefings are one of a hundred ways that we stock our pond," Dr. Sachs says.

Medical Comedies

Even primetime comedies that milk hospitals for laughs employ physicians. Indeed, at the popular series *Scrubs*, the lead character is not the only named J.D. Dr. John Doris, a fraternity brother of the show's creator, is known as the

"real" J.D. by the writers, who depend on him to fill the medical blanks in their scripts.

Early in the series, which is now in its sixth season, the writers often just left placeholders in their scripts like "medical jargon here."

"Now we are a little bit better about calling J.D. as we are writing our scripts, and saying, 'OK, I've got this guy, and I need to have a disease where he would be really, really sick and he might die, but he's not going to die, and it's got to be in his liver area, because we don't want his face to look bad, and

"A nurse is the primary on-set medical adviser for House—rather ironic since the show has been criticized by nurses for often portraying them as little more than housekeepers and rarely showing nurses providing direct medical care. The nurse is there for all the medical scenes, monitoring such things as making sure that scalpels are held correctly, or a patient is draped correctly, or a patient is wearing gowns when they should be wearing gowns, or that when they are in x-ray that they are wearing protective lead aprons."

he's got to be able to tell a joke once in a while. Now what about that be?" says supervising producer Janae Bakken.

Bakken says that in order to learn about medical reality before spinning their humorous yarns, the show's writers are required to read books about medicine, including the wrenching portrayal of medical school in the 1970s, *The House of God* by Samuel Shem. And before each season, each writer has to interview at least three doctors.

A *Scrubs* episode recently honored with a Sentinel for Health award by the HH&S program grew out of a TV documentary program on partial liver transplants that a writer had seen.

'They Call Me Mellow Yellow'

"They Call Me Mellow Yellow," were the first words said, or rather sung, by the patient with hepatitis in that episode, titled "My Chopped Liver." The show explored the human drama and comedy to be found in a story of a brother giving part of his liver to his deathly ill sibling.

As the story was told, the recipient recovered nicely, but the donor was hit with life-threatening complications. Meanwhile, the show's main character, J.D., was dealing with his own questions about altruism.

"How can you do an episode about giving part of yourself to a friend?" was the task Bakken says the writers faced. "And then you parallel that personal (continued on page 55)



Rx only

INDICATIONS AND USAGE
ETHYLOL (amifostine) is indicated to reduce the cumulative renal toxicity associated with repeated administration of cisplatin in patients with advanced ovarian cancer.
ETHYLOL is indicated to reduce the incidence of myelosuppression in patients receiving cyclophosphamide for breast cancer patients who are receiving palliative or adjuvant chemotherapy for breast cancer.

CONTRAINDICATIONS

ETHYLOL is contraindicated in patients with known hypersensitivity to amifostine or any of its components.

WARNINGS

Cardiovascular Effects: In a clinical trial, patients receiving amifostine experienced a decrease in systolic blood pressure during the first 30 minutes of administration. This decrease was more pronounced in patients receiving amifostine than in patients receiving placebo. The decrease in blood pressure was transient and returned to baseline within 30 minutes. Patients receiving amifostine should be monitored for hypotension during and after administration. Patients should be treated with intravenous fluids if hypotension occurs. Patients should be treated with intravenous fluids if hypotension occurs. Patients should be treated with intravenous fluids if hypotension occurs.

PRECAUTIONS

General

Patients should be adequately hydrated prior to the ETHYLOL infusion and fluid intake should be maintained (see DOSAGE AND ADMINISTRATION).

Use in Specific Populations

The safety of ETHYLOL administration has not been established in elderly patients, in patients with preexisting renal impairment, or in patients with severe renal impairment, or in patients with severe hepatic impairment, or in patients with severe pulmonary impairment.

Renal Impairment

Patients with renal impairment should be treated with caution. Patients with renal impairment should be treated with caution.

Drug Interactions

Patients should be monitored for hypotension when ETHYLOL is administered with cisplatin, cyclophosphamide, and other cytotoxic agents.

Concomitant Medication

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ADVERSE REACTIONS
Controlled Trials
In the randomized study of patients with ovarian cancer, the most common adverse effects of ETHYLOL were hypotension, nausea, and vomiting. The most common adverse effects of cisplatin were myelosuppression, nephrotoxicity, and ototoxicity.

Table with 4 columns: Adverse Event, Placebo (n=117), ETHYLOL (n=117), Placebo (n=117), ETHYLOL (n=117). Rows include Nausea/Vomiting, Hypotension, etc.

Table 1. Adverse Effects of ETHYLOL in Patients Receiving Cisplatin.

In the randomized study of patients with breast cancer, the most common adverse effects of ETHYLOL were hypotension, nausea, and vomiting. The most common adverse effects of cyclophosphamide were myelosuppression, nausea, and vomiting.

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Stabilizing Bone after Vertebral Fracture Leaves Room for Meds

By Robert H. Carlson

SAN ANTONIO, TX—Vertebroplasty and kyphoplasty present a great opportunity for oncologists treating cancer-related vertebral pain because treatment medication can be added to the cement.

That add-on benefit might not have occurred to those who originated the procedures, but it does make sense, said a speaker here at the International Meeting on Cancer Induced Bone Disease.

"Nobody said what to put in the cement," said Joseph M. Lane, MD, Professor of Surgery at the Hospital for Special Surgery in New York City.

Surgeons using vertebroplasty



Robert H. Carlson

Joseph M. Lane, MD, said he and colleagues have been adding a monthly dose of zoledronic acid to the cement in certain cases, which he said results in local control of the bone as well as providing systemic treatment. "In our studies we have found that up to 10 percent replacement [of cement with an agent] will not weaken the cement, so there is an enormous volume of space available to put material in," he said.

"Patient pain is related to the tumor and the mechanical instability, and radiation will not address those—you want to reestablish stability. On the other hand, reestablishing stability without controlling the tumor is of no advantage either—that's why we're looking for some sort of combination approach so we can control the tumor as well as regain the stability for the vertebral body."

inject cement directly into a myeloma lesion to stabilize the bone. Kyphoplasty changes the dimensions of the bone—an orthopedic balloon is inserted into the fractured bone and inflated to reduce the fracture and correct the alignment. After that the balloon is removed and the cement put in.

Dr. Lane said he and colleagues have been adding a monthly dose of zoledronic acid to the cement in certain cases, which he said results in local control of the bone as well as providing systemic treatment.

"In our studies we have found that up to 10 percent replacement [of cement with an agent] will not weaken the cement, so there is an enormous volume of space available to put material in," he said.

Vertebral fractures occur commonly during treatment for multiple myeloma, as the combined tumor resorption and the drug-related osteoporosis combine to generate low energy fragility fractures, Dr. Lane explained. These can result in pain, deformity, gait abnormalities, pulmonary compromise, and increased risk of falls.

"Patient pain is related to the tumor and also to the mechanical instability, and radiation will not address those—you want to reestablish stability," Dr. Lane said. "On the other hand, reestablishing stability without controlling the tumor is of no advantage either—that's why we're looking for some sort of combination approach so we can control the tumor as well as regain the stability for the vertebral body."

Dr. Lane added that clinical trials are needed to determine whether putting agents in to protect the bone and/or treat the tumor should be standard practice.

Kyphoplasty Restores Height

Vertebroplasty was developed in France and Spain in the 1980s, and

kyphoplasty in the 1990s. Vertebroplasty is more common performed, originally by neurosurgeons and orthopedists but nowadays by interventional radiology oncologists as well, Dr. Lane noted.

Kyphoplasty's advantage over vertebroplasty is that vertebral augmentation with the balloon tamp partially restores vertebral height, decreases kyphosis, and relieves pain.

"There is no question that vertebroplasty reduces pain about the same as kyphoplasty and increases mobility because of pain relief, but there is no reduction of fracture as with kyphoplasty," he said. "The issue is, how important is it to correct the alignment of the spine?"

He noted that multiple myeloma studies by his group show that kyphoplasty can restore up to 50% of a patient's height, reduce kyphosis by about 50%, and significantly improve pain relief and function (Lane JM, et al: *Clinical Orthopedics and Related Research* 2004;426:49-53)

Complications of kyphoplasty are minimal, he said, but issues of remain-

Vertebral fractures occur commonly during treatment for multiple myeloma, as the combined tumor resorption and the drug-related osteoporosis combine to generate low-energy fragility fractures. These can result in pain, deformity, gait abnormalities, pulmonary compromise, and increased risk of falls.

ing concern are the timing of kyphoplasty and bisphosphonate-generated bone brittleness.

And so far the technique does not appear to be appropriate for solid tumors.

"Those are troublesome—that has yet to be worked out," Dr. Lane said. "With a liquid tumor, the balloon can displace the tumor and fit into it, whereas a solid tumor would work as a barrier for the balloon."

He said the surgeon could "power past" the solid tumor and get support for the vertebral body, but that would not displace the tumor very well.



Robert H. Carlson

Denis R. Clohisy, MD: "The major determinant of whether to use kyphoplasty or vertebroplasty should be the safety and risk side of one treatment versus the other."

"I suspect some other adjuvant technique will have to be used such as a laser technique to dissolve the tumor and create a cavity," he said.

Always Biopsy

Dr. Lane warned clinicians to never do either procedure without first doing a biopsy.

"One of every 80 people who have had a kyphoplasty or vertebroplasty for osteoporosis had underlying lymphoma," he said.

Even if the diagnosis of cancer has been made, a biopsy before these procedures allows the oncologist to reassess the treatment protocols based on the efficacy of treatment.

The biopsy also may show the opposite—that there is no tumor in the fracture. "Just because your myeloma patient has a fracture does not necessarily mean there is tumor there," he said.

Early on, patients with myeloma will get fractures from the tumor. But once they are in remission for several years and they get a fracture, frequently

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story of J.D. helping a friend out giving up something of himself, with the story of a patient and his brother. [The partial liver donor] doesn't want his brother to know he's feeling so sick, because that wouldn't be altruistic," Bakken says.

And that human drama, leavened by comedy in this case, is the point of all the steps taken by entertainment TV shows to ensure medical accuracy. When it's done right, then the story rings true.

Stay tuned next time for "HH&S makes a Hollywood House Call."