



It encapsulates our vision; that truly there are no boundaries.  
Each of us travel a unique path and can come together to create.  
Endless possibilities and potentials exist. The sky is no limit!

# Healthcare Worldwide Central

[www.globalwellnessemagazine.us](http://www.globalwellnessemagazine.us)

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*e-magazine*

Our cover is suggested by  
Dr. Mansoor Ahmed

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# "Connecting the Educational and Clinical Essentials"

## Dear Worldwide Colleagues,

Healthcare Worldwide Central e-magazine is an international e-magazine dedicated to publishing high quality articles, review articles, case studies, surveys, commentaries, news, interviews, reports, ethics, pharmaceuticals, and bio-ethics in Healthcare.

This magazine welcomes worldwide contributions. The intention is to distinguish forthcoming vision in the worldwide community. This is an Educational and Clinical Essentials Community Service Magazine with a Worldwide cooperative reach.

The e-magazine is published on a quarterly basis. There are four categories for clear, concise, educational and clinical essentials:

Announcements

Featured Articles

Insight Perspective

Clinical Corner



## Please enjoy this issue.

Dr. Efrat Ron offers her viewpoint in Insight Perspective. Dr. Ron is a graduate of Umass Amherst and Northeastern University. Specialties include medication knowledge of FDA approvals and off-label uses, HCPCS and ICD-9 codes, data-mining, counseling, intervention therapies and compliance.

Karrie Lynne Hanna, RN, Vice-President DLK Ventures, authors "The Passage Toward Surrender" in Clinical Corner. Surrender, the noun and the verb. Originally from Old French, surrendre, sur- "over" and -rendre "get back". In the reflexive voice surrender means 'to get oneself back'.

Featured Article is "Palliative CARE - a Shared Circle" In the creation of palliative care programs, hospitals can conserve healthcare dollars. Palliative care emphasizes the quality of life with significant reductions in per diem and total costs. This can produce considerable savings to the health system by "cost avoidance."

Healthcare Worldwide Central provides quarterly educational and clinical essentials.

Best wishes,

**Dr. Diana Rangaves**

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Executive Editor

Healthcare Worldwide Central e-magazine

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[www.globalwellnessemagazine.us](http://www.globalwellnessemagazine.us)

## **Our client is looking for a Sr. Pharmacist Willow for a permanent opportunity to start immediately in Sacramento, CA.**

### Description

### Responsibilities

These positions will provide clinical and technical support for Pharmacy Information system for the EMR and related billing, clinical applications and systems. The incumbents will be members of the Willow Pharmacy Team with the responsibility to oversee and participate in the building and maintenance of Pharmacy systems within the Health Systems information systems, integrated medication record and pharmacy related applications. Requirements Licensed Pharmacist in the State of California. Doctor of Pharmacy degree or equivalent clinical experience. Working knowledge of Pharmacy ambulatory operations and experience in pharmacy medications required. Demonstrated experience in pharmacy computer implementation and /or computer maintenance experience preferred. Previous experience working in academic institution or large integrated health system preferred. Experience working with interfaced/integrated multi-vendor applications preferred. Epic certification in Willow preferred. Experience implementing EMR medication pharmacy system preferred. Epic Care, Rx Willow, Willow Ambulatory, Epic Resolute, and Charge Router Certification within 12 months after hire.

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# Mission...

Dear Worldwide Colleagues,

I hope these words find you well.

The mission of Healthcare Worldwide Central e-Magazine is to unite the community for professional collaboration and subject-matter expertise.

Healthcare Worldwide Central e-Magazine goal is to create a Community. This e-Magazine's purpose is to inform, educate, provide perspectives, publish peer reviewed papers, reviews, and articles related to Healthcare.

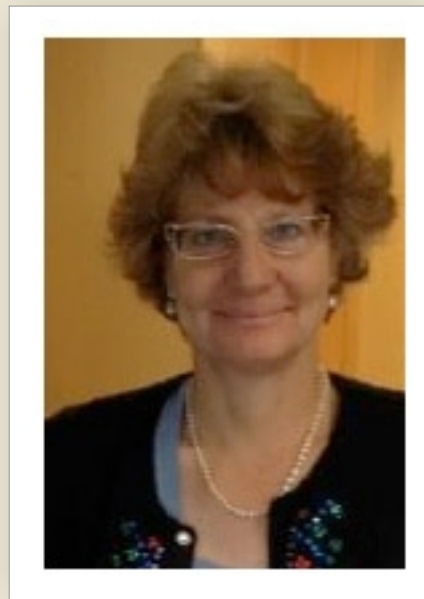
The e-Magazine is published with the assistance of a Lifescience Global. They are committed to publishing and providing a platform for worldwide dissemination using the 'Open Access' publishing model.

We would like to invite you to submit a manuscript for publication. The e-Magazine accepts original articles, research papers, reviews, essays, expositions, and commentaries.

Our objective is to draw an editorial vision; therefore, we accept viewpoints on multiple topics of interest.

Please send your contribution to my attention at  
[drangaves@clinicalconsultantservices.info](mailto:drangaves@clinicalconsultantservices.info)

Thank you for introducing and offering a unique opportunity for us to be of service.



Best wishes,

**Dr. Diana Rangaves**

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# Feature Articles...

SRJC Faculty Show

**ART-a-Pharm-a-LOGY**  
**Measuring the Un-measurable**

**ART - PHARMACOLOGY -a Collaboration**

Renata Breth, MFA - Art Diana Rangaves, PharmD, RPh - Pharmacy Technology Program

**EMR- Master Classroom “It always seems impossible until its’ done”.**

**-Nelson Mandela**

- Diana Rangaves, PharmD, Rph

## **FEATURED Palliative Care**

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# INSIGHT PERSPECTIVE

## Pharmacists as Healthcare Providers By Efrat Ron, PharmD

### “Pharmacists: Can we really be Providers?”

Let's start this discussion with, “What is a provider?” A provider (in the medical field) is an individual who provides specific services to their patients. The services, usually in the form of knowledge, are reimbursable by the insurance companies. Some examples of providers include: Physicians, Nurse Practitioners, Physician Assistants and Nurses.

So, “Are pharmacists providers?”

Pharmacists, like all other health professionals, can obtain a National Provider Identification number (NPI). We can bill for some services, as they relate to medications and therapy, but are restricted in the sense; the billing has to be done within the context of a pharmacy. Subsequently, pharmacists, unlike some of the providers listed above; do not have a Drug Enforcement Administration (DEA) number, which is needed on the bill in order to obtain reimbursement.

So again, “Are pharmacists providers?”

The answer is – “No.” Pharmacists are not providers, according to all the acts that have been enacted thus far. Wait, “What is going on?” Let's take a look at the kinds of medical services a pharmacist provides.

1. Pharmacists provide something called Medication Therapy Management or as most people know it, MTM; an intense scrutiny of all the patients medications, and how the medications are playing a part in their therapy.

2. Pharmacists will make sure the medications are; being used properly, taken properly, and the patient understands why they are taking the medication

3. Pharmacist will recommend to the patient's physicians; possible improved usage of the medications or other medications to make the patient's life easier.

4. Pharmacists will make sure that there are not too many side effects are occurring, and the patient tolerates the medication

5. Pharmacist can provide: immunizations, vaccinations, diabetic education/coaching, anticoagulation, pain management, and anything else that relates to medication therapy.

So, pharmacists are not recognized as health care providers, even though we provide medically-related services, “Huh?”

Consider the services provided at another partner in pharmacy.

“Independent Pharmacy: Are They a Dying Breed?”

Small business or Independents are needed to balance the power that big chains or corporations have in the marketplace. Independents make sure there is no monopoly of power in the marketplace, and fair market practices can occur; meaning, not one chain or corporation controls the market prices and rates. First of all, they are the backbone to any small community; usually one or two stores selling the same stuff.

Secondly, the owners depend on your business just like you depend on them for advice on medications or another role of toilet paper. Thirdly, you get to know the business owners, as they are there so often, and they become valued community members. Small business owners usually partner with other business

owners to get what they need. Not only that, when they partner with other small business owners, they get to help other businesses. They know people need jobs and by opening their doors, they created another avenue for that to happen.

Independents are usually pharmacies having at the most 5 stores, most often limited to only one store; usually run by the owner or even a family member of the owner, and not conveniently open, or to get to, because they are not on every corner. Independents are generally open whenever the owner can get in, or get employees to cover the store/pharmacy. Yet, there are benefits to visiting, bringing your business, or otherwise supporting Independents.

These small business owners realized that they depend on your business. Most therefore, go above and beyond to make sure you are happy. Independents may provide services not otherwise found at big chain stores like:

1. Spending time talking to you regarding your medications.
2. Making sure you are not getting any unwanted effects from your medications.
3. Possibly offering the service of compounding medications for you, if not available commercially.
4. Can decrease your medical expenses by taking the time to talk to you about your medication therapy, and how you are doing.

Proud Independent owners hope that someone else takes the risk to open their doors to another store, and can know the joys of being in charge of your own store. The business owners may dream of being bought by the chains, but most enjoy working on their own terms. They know, at one point, chains were small businesses like them, and wonder; if they can take their own store to the same height or something similar.

**So the questions become:**

“Are small businesses able to make a profit in today’s competitive market?”

“Are the world’s expectations so unrealistic and so demanding, corners had to be cut?”

“Is there a place for the small stores where pharmacists know your name and are valuable

members of the community you live in? “, or; “Are those days forever gone from the American pharmacy landscape?”

Whether corporate, chain, or Independent ask:

“Why would a pharmacist want to do this?”

1. The fact is, not all pharmacists have the time to do this for patients when patients pick up their medications from the pharmacy, and as a group of health care providers, we want to make sure a patient’s quality of life is enhanced from the medications being taken.

**“Why do we as pharmacists want provider status?”**

Basically it comes down to two major reasons:

1.) Having provider status will give pharmacist the recognition; we are truly an important part of the medical team.

2.) Pharmacists are then able to bill for all the services we provide for patients.

Put in to other words, by providing MTM or other services, a pharmacist is making sure patients are able to tolerate their medications, and their medications don’t cost the patient too much money.

**So, what do you think?**

Do you think pharmacists should be considered providers?

Why or why not? Do you think pharmacists are knowledgeable enough to provide these services?

Why or why not?

Efrat is currently working at Mountain Park Health Center, working as staff pharmacist and in their Coumadin Clinic. Efrat works under the Director of Pharmacy, Alana Podwika, and Pharmacy Supervisor Stanley Paul Kudish.

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## CLINICAL CORNER

## The Passage Toward Surrender

by

Karrie Lynne Hanna, RN  
Vice-President DLK Ventures  
dba Hanna House, RCFE

Surrender, the noun and the verb. Originally from Old French, *surrendre*, sur- “over” and -rendre “get back”. In the reflexive voice surrender means ‘to get oneself back.’

In our world “doing” is the principle of choice. The outward perception of us and what others view as us is all encompassing. This state of subsistence leaves little awareness for the inward journey, our true state of Being.

Enter dementia, enter surrender and finally trust.

Moment by moment the perceptual field oscillates. Reality is no longer fixed. There are unsettling deviations, variations, adjustments, and transformations. Initially, observed outwardly as a loss, one sees the pain of vulnerability and nakedness. The outward melting softens the inward path of the awakening. This is the thawing truth of the experiential journey.

This is a profound and courageous undertaking. How do we embrace, empower, and support our elders who are walking into the night of their own wisdom?

The presence of their own self, their own soul touches all of us in a way that changes the planet forever. This is the generation that has changed and held on to the potential of us all. This is the primal journey of the love for all of us.

Every disease leads us to information about ourselves and the life that we lead.

Each corridor moves the self-enclosed, by family or social system on to go outside the box of ‘normal’ experience. The reality with different lens can transform and change who we are. Healing is the balance of both extremes.

Our life is one of interpreting situations, environments, people, etc. in order to seek out bottom line issues of safety and a position of security. We all develop defense mechanisms in this world. Each of us has learned how to guard ourselves in such a way not to be

touched by fear and pain. Paradoxically, in our efforts to protect from wounding, the wounds grow, leading to a very long passage to ‘get oneself back’ and trust.

Logically dementia demands this. There is a shift in the engagement from outward to inward. Instinctually the internal guidance system steers toward a new level of safety. This simple shift can be seen in behaviors. An elder, who all their life hated, eating tomatoes, now eats tomatoes without a logical or visual cue that something has changed in their life.

The altered perception of who we are and who we use to be is a continual process, an evolution involving all stages of growth and development. The physical self is no longer engaged as it once was. There is less crisis and more peace of mind and body.

Social and world relationships are altered in the parts that we have played and the characters that we have known. These fixed positions of work persona, mother, father, bread winner, etc. are transformed. The sense of position has changed. Within the community of dementia elders discover new roles of watcher, the observer, helper, and scout, which enhance their quality of life and opens a new box. This level of acceptance creates the conditions for rebuilding self-esteem and the opportunity to embrace the gifts of whom and why they are.

The beauty, wisdom and courage that each elder accepts are absolutely breathtaking. Those walk with dementia, a masterpiece of profound evolution that is to be remembered and appreciated for a lifetime. The internal dances will replay, like a scratched record skipping until something kicks the self into a new song. Love leads the way.

This dance is with the ideas of death and connection. The final relationship is with you. Step by step the soulful expression of life comes together with meaning and value. Being of service to an elder to achieve peace and contentment is a unique form of healing. This healing recognizes the soul and the

understanding of human experience. Only by understanding who we have been can we discern what we take with us and what we leave behind.

My brother and I were raised in a family system with a sister who was diagnosed with autism in the 1960’s. This was a distinctive experience, the ability to live in a different box of knowledge. In order to be with her we needed a different communication style based on behavioral, emotional, and intuitive cues. We needed to observe the essence of her soul. A world that is foreign to most of us, which is validated only through a shift in perception. This destination does not bring fear, rather awareness, learning, and purpose.

To evolve we must look at what is and be open to information that we do not yet know or understand. One degree of directional change can greatly impact the destination. By forming collaborative partnerships with the elder, health care, and the family system that is present we will walk the journey together. It takes a community to raise a child. It takes a community to walk with an elder through the later days of life. This is a challenge since everyone has an image of how it should be.

Every voice is important particularly where the landscape is unclear and the road is twisting. We can focus on this part of reality and find the way to wisdom. By working authentically one discovers new places being brought forth by choice. By diminishing the passive aggressive push at control one permits creation to take place.

**There is a gift.**

Karrie Lynne Hanna, RN, Vice-President DLK Ventures, authors “The Passage Toward Surrender”

Prepared for publication by  
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SRJC Faculty Show

## ART-a-Pharm-a-LOGY Measuring the Un-measurable

### ART - PHARMACOLOGY -a Collaboration

Renata Breth, MFA - Art Diana Rangaves, PharmD,  
RPh - Pharmacy Technology Program

## Abstract

Student Success is a priority. Efficient utilization of resources, an increase in college completion, and engagement has always been the focus.

Our success is built upon student success, one student and one course at a time. High expectations are a condition for student success. Potentials and performance, driven by the expectations that employers have for our students and that the students have for themselves, enhance students' success academically and professionally.

Contextualized academic support involves reshaping conventional assumptions. Evidence based knowledge aligns communities and institutions to obtain the needed support to acquire skills and learn content.

This integration forms the basis for Engagement. By becoming a part of the process, students experience the curriculum, as they do in learning communities, and in the way they experience learning. They do so by employing pedagogies of engagement, such as cooperative understanding and problem or project-based study that requires students to work together. In this form of collaboration they become active, indeed responsible, for the knowledge of the group and classroom peers. Students share, not only the experience of the curriculum, but also learning within the curriculum.

So how do we measure the Soul's development process?

The Arts deal with massive relationships and chemical reactions. We are a human car whose spark plugs are the catalyst, igniting at interchanging connections, instantly without hesitation. The principle acquisition and creation of knowledge plays a fundamental role in the appreciation and innovation of new knowledge. This balanced co-efficiency fosters a rich understanding of human experience.

The Arts advance student success, the community workforce, employee retention and engagement. The Arts offer a way of thinking unavailable in other disciplines—"connecting the unconnected" in discernment and critical thinking competencies.

There are ALWAYS workarounds and paths to follow. Flexibility, adaptability, and 'seeing', are willingly learned skills of discernment. Artists, beyond names and forms, serve the larger community.

Steve Jobs- <http://www.youtube.com/watch?v=Tb7Sq9-Jtlg>

"Life is full of choices; the beauty of life is you have choices!" -Albert Schweitzer

Sharing and teaching is a true art that ignites a deep well of passion within the human spirit.

**Our students deserve no less.**

## Suzanne Lacke “Car Series- Happy Alone”



<http://www.santarosa.edu/art-gallery/slideshows/faculty-2012/lacke-02.php>

“Car Series- Happy Alone” by the artist, Suzanne Lacke.

This is a painting of an elderly man who is sitting alone in his car waiting in traffic. I chose this painting because there is a lot of tension when it comes to the elderly wanting to do things on their own. First, they want to do things on their own, such as taking their medicines. This is not always good because they may not remember what medications they need to take and at what time. Others may not be compliant and take more of a medication because they possibly forgot a dose earlier in the day. They might also feel like the more medication they take, the better it will be for them. Another issue, it made me think about was depression. People might become really depressed if they are alone and feel like no one is there to help or talk to. They might say they prefer to be alone and they really don't. This brings antidepressants into play as well. Some people might be put on antidepressants due to their state of mind and being and depending on their reactions some might have good reactions whereas others might have worsened side effects, such as being suicidal. - JV, Student Pharmacy Technician.

## Boxers by William Smith (graphite on paper), 2011



<http://www.santarosa.edu/art-gallery/slideshows/faculty-2012/smith-01.php>

The Boxers illustration in graphite depicts two boxers in motion. It is a cartoon-like representation of two characters boxing and the artist has added motion to the illustration by adding double and triple effects to give the illusion of the motion that happens as you give and take a “punch” to the face. You can almost feel the layers of slow-motion distortion. When I saw this drawing, I stopped and thought of what happens with agonists and antagonists .....fighting it out... neuronically that is... with deliberate blows aimed at the recipient (receptor) and counter moves designed to ‘block’ or avert blows; both moves resulting in change. All of this taking place pharmaceutically to remedy disease with specific drug selections that provide the right “punch” to the right place (direct blows and blocking blows) to gain control of a disease state. Of course, none of this happens without residual or side effects or consequences to the health of the organism. The boxers sustain cuts, bruises, internal injury, etc., and the drug side effects always carry the risk of unwanted physical responses. - CC, Pharmacy Technology Program

As I browsed the Art Gallery, I discovered an interesting picture. I noticed that the artist who drew this image had two boxers fighting. The picture looked like a third dimension figure. At first, the drawing looked very tricky, but I spent few minutes to decode the meaning of this fabulous piece of art. As I deeply studied the picture, I noticed that both boxers seemed extremely hurt, but one, however, had one black eye. His mouth was open and some teeth were missing; by this point, I could tell that the opponent was defeating him. The other boxer seemed hurt, but not as bad as the other one.

Pharmaceutical products allow us to relieve pain, to control diseases, to extend our longevity, and to control our population; in short to improve our health and well-being. Therefore, I found this picture, however, very interesting because modern medicine offer many health benefits. One of those benefits is an analgesics product, for someone who has been extremely injured just like the defeated boxer; must spent few days in the hospital consuming possible Oxycontin or Hydrocodone for pain relief. Also, this boxer must be treated with antibiotics to treat any infection from body injury. -AE, Student Pharmacy Technician

### William Smith “Pig”



<http://www.santarosa.edu/art-gallery/slideshows/faculty-2012/smith-02.php>

Bipolar Disorder - William Smith's 1% Pig (2011) illustration really reminded me of a particular mental disorder, bipolar disorder. The graphite on paper illustration is a figure that, at first glance, resembles a human with arms and legs. At a second glance, you realize it has seven arms and six legs in motion and about five pig heads. Not only does this grossly disfigured pig have multiple limbs, but each arm seem to be doing something hazardous in some manner (two guns, one pointed to himself, knife, cigar smoking, gluttony, crotch holding). Bipolar disorder is defined as a mood disorder that has one or more types of

elevated moods (mania or hypomania). The severe kind of mania can lead to psychotic symptoms, not excluding "bizarre behavior" which is what 1% Pig reminds me of. This confused pig should be treated with antidepressants so he can lead a normal pig life. We've discussed the use of lithium to treat bipolar disorder. Unlike most antidepressants, lithium is not a sedative nor does it involve suppressing the CNS. It corrects the chemical imbalance by shifting particular chemicals in the brain. Specifically, lithium competes with cations like sodium or potassium. Lithium is the only recommended treatment for bipolar disorder and can help people (and this pig) tremendously. -JG, Student Pharmacy Technician.

1% Pig by William Smith- As you know I'm doing my research paper on bipolar disorder and in this picture it shows a pig switching moods from the sides but all connected in the middle. When I saw the pig's Bipolar disorder came to mind because it's a disorder that affects people's mood and the pig seems to be changing moods. For example the pig holding the knife made me think of someone having a manic episode because it looks like he's extremely disturbed. In my opening paragraph my sister was diagnosed with bipolar disorder and snapped, well the pig with the knife reminded me of how we came to find out she was bipolar. She stabbed a girl and it was all due



to her having mood swing not being on medication to help her stabilize her mood. It is very important that people who need medications to take them so they don't go through what the little pig seems to be going through which is a bunch of mood swings and help him to keep from losing it! -NM, Student Pharmacy Technician.

The art piece by William Smith, titled 1% Pig, caught my attention. It was created in 2011 by using graphite on paper. The artwork reminds me of hallucinogen drugs. Hallucinations are the perception of somebody or something that is not really there, which is often a symptom of a psychiatric disorder or a response to some drugs. The drawing resembles a bad "trip". The image of the pig is something that you would never see in real life. The drawing has one main pig with multiple heads. It is wearing clothes and standing on two feet like a human being. I imagine that this is one of the hallucinations that a person would have if they were the drug. Each head on the pig is doing something different. The heads are either drinking, smoking, or eating. I feel like the image is something that the individual who is under the influence would experience. There are lines around the pig to imply that it is in motion. The motion is going in a circle like it is quickly spinning around. It has an effect that people who are abusing drugs are trying to achieve. Some people like the effects of hallucinations. They can build a tolerance to the drugs. -LS, Student Pharmacy Technician

### John Bessie, "Earthtracks"

<http://jbessie.photoshelter.com/>

There were many paintings that I liked and that made me think of actions in the body; whether it is a synapse or some other movement in the body. John Bessie's, "Earthtracks" made me think of what a synapse looks like when it happens; bright and beautiful. -MD, Student Pharmacy Technician.

This portrait to me relates to the concepts that are discussed in Chapter 6 "The Autonomic Nervous System". I think the image can be used to show how the adrenergic drugs are able to affect the receptors located in the sympathetic nervous system. These receptors are activated by Norepinephrine, Epinephrine and dopamine which are all three similar in structure. Adrenergic medications activate or block the receptors that are responsible for controlling the release of neurotransmitters at the synapse.

The image I feel details this process that is related to pharmacology very well. For example it shows how the adrenergic agonists medication are able to bind to the receptors needed to then activate the binding of the neurotransmitters that are in the brain. They act very similar to adrenaline in their therapeutic effect that is why this portrait can be used for a great representation showing how adrenergic receptors  $\alpha_1$ ,  $\alpha_2$ ,  $\beta_1$ ,  $\beta_2$  and  $\beta_3$  work by affecting the uptake and the storage mechanisms of the adrenergic catecholamine's prolonging their action. -AR, Student Pharmacy Technician.

This piece was the first one to grab my attention when I walked inside the show room. I just love how simple it is but at the same time, I was free to play around what it could mean. Since I was doing it for my Pharmacology class, I thought of it as an illustration of the circulatory system. The sun acts as the heart while the wheel tracks are the veins around the body. The sunlight can be seen as the blood travelling from the sun (heart) to the veins (wheel tracks). -JT, Student Pharmacy Technician.

I really liked John Bressie's photograph entitled "Earth Tracks" (2011) immediately made me think of the Central Nervous System. This very beautiful photograph depicts an expanse of muddy desert wrought with tire tracks with a distant mountain range under a brilliant sun. The aura around the sun seems to almost touch the ground and connect with the tired tracks. The sun makes me think of the human brain. The brilliance of the light symbolizing the electric current produced there sends a pulse down to the tracks. The tracks themselves crisscross, going off into all different directions, presumably to various sites such as the limbs, down to the fingertips and toes. Yet all of these tracks to all of these different sites all seem to come back to a central line down the middle of the photograph, as if this central line were the spinal cord. -AS, Student Pharmacy Technician

### Don Feasel, "Maldon"

<http://www.briangrossfineart.com/artists/dfeasel/index.html>



<http://www.santarosa.edu/art-gallery/slideshows/faculty-2012/feasel-01.php>

Don Feasel's painting, "Maldon", reminded me of the path for normal nerve impulse conduction as it moves from the Dendrites to the cell body to the axon to the synapse. - MD, Student Pharmacy Technician.

The painting by Don Feasel reminds me of dendrites and axons within the nervous system. The painting could be interpreted as a small snapshot of the connections and transmissions within the neural network that make up the nervous system. The Dendrites extend and branch off the cell body. The axons stretch out to make connections with the other neurons. The neurons are passing electrical or chemical signals to other neurons. The synaptic cleft can even be seen where the neurons link together to carry out the signaling process. - KG, Student Pharmacy Technician.

Pain, Pain Go Away - this painting, with its jagged lines and angular slashes in dark against a white background struck me as something as sharp and strong as barbed wire; something that delivers pain. For me this painting represents pain. Pharmacology expends much time, energy and money to develop drugs to alleviate pain. This is not to say they make pain go away. They just alleviate the perception of pain for the patient. In many cases, just like in the artwork, a period of pain, whether they are sharp jabs or a sustained, dull throb disappears after time because of a healing.

Just as in the way the lines of pain 'disappeared' into the end of the canvas. For many, however, pain stays within the body for a long time. Some live with chronic pain all their lives. The underlying cause may never be fully discovered or might be found untreatable. Much in the way the drawing had sharp upward jabs followed by a flatline, perhaps illustrating the onset of pain and the slight, temporary relief from pain. But as we know in the human body and just like in the painting, pain will be back with another upward spike unless the root cause of the pain is fixed or that a steady state of a prescribed analgesic is achieved. I would bet that for those who live with

chronic pain, many would feel that the painting illustrates their day to day experience with pain. Thanks for the opportunity - I was surprised at how good the exhibit was! - WS, Student Pharmacy Technician.

I noticed Don Feasel's painting the first time I visited the art exhibit and at that time felt 'speechless' in responding to it. So, it is with gratitude that I returned to the art exhibit and not just for the opportunity for additional bonus points but to write about this piece as it is about my mother's journey with Alzheimer's. As I wrote about her loss of cognitive function, only parts of her story are highlighted and others left to the imagination. Just like this painting, the whole story does not need to be told because what is missing is just as important.

Simply titled or untitled painting, this piece caught my attention for its simplicity of strokes and then I became intrigued at how much was accomplished by the illusion of what appeared to be missing or the intentional absence of strokes. Striking in its sparseness, I couldn't help but connect this to Alzheimer's syndrome, defined as the progressive loss of cholinergic neurons as the likely cause of memory loss. Inhibition of acetylcholinesterase within the central nervous system is thought to improve cholinergic transmission of those neurons still functioning; and there are a number of anticholinesterase drugs that penetrate the central nervous system which are approved for the treatment of mild to moderate Alzheimer's syndrome. My mother was on more than one of these medications the last several years of her life.

As I looked on at this painting, I sat down on the floor and thought of my mother. I noticed the fading loss of structure to the lines – there and not there – and at times fading and disappearing into the neutral canvas. Like how my mother was 'not there at times'. At other times, the lines seemed like disconnected dendrites; reminding me of the gradual and progressive loss of memory. Nonetheless, this progression continues until the neurons that conduct impulses to nerve cells no longer exist. The doctors called my mother's illness 'dementia' while she was alive, and when she passed on October 22, 2010, the cause of death was listed as Alzheimer's.

My mother's name was Evelyn but everyone called her Evy. I observed her fading over a period of years but at times still able to catch glimpses of her, on the days I took the time to be with her and look closer, especially those moments when she could laugh. So, as I sat then stood to move closer to the painting, it reminded me of those moments when I could experience 'hints of her old self' and other moments when the dendritic threadlike extensions of her system started to fade. One month prior to my mom's passing; she was taken off all her medications. She no longer spoke or ate. Her fading presence and disconnects were intensified. She remained alive for a month only responding with short random and staccato sounds to music I played while visiting her. I knew it then, but just like looking at the painting now, I know the medications had allowed the minimal connections to occur. -CC, Pharmacy Technology Program.

To the basic eye, this piece done by Don Feasel looks to me like electrical impulses. There are two types of cells in the nervous system, neurons and glial cells. Neurons conduct electrical impulses and are highly specialized cells. Neurons play a central role in cell to cell communication. These electrical impulses are translated into information by effector cells. These cells respond to nerve impulses. Dendrites collect the information and shoot it into the cell body and nucleus as an electrical impulse. Then the electrical impulse is shot down the axon to the cells in which it is attached too. Actions are generated by special types of voltage gated ion channels embedded in a cell membrane. Now these electrical impulses are actually positive and negatively charged sodium ions and potassium ions, chemicals and not electricity that one finds in your home! Neurotransmitters move information through the body in both the peripheral and central nervous system. -FR, Student Pharmacy Technician.

Nervous System- Don Feasel's untitled painting has a white background (canvas) with very thin black/dark brown strands that look like bamboo shoots with the occasional stem sticking out of each shoot. What's interesting is that the shoots are frequently disrupted with a white blotch, making the shoot look disconnected. In the center of the piece is a black blotch where four shoots are expanding from. I am immediately reminded of our nervous system from this painting. The center blotch would represent the brain or spinal cord (from a top down perspective if you will) which is our central nervous system. The shoots extending out of that blotch would represent the peripheral nervous system. Our PNS has two systems called the autonomic and somatic nervous system. Within the autonomic system, we have two types: Sympathetic and Parasympathetic. Sympathetic, or SANS, is in charge of adjusting the body functions in stressful situations (fight vs. flight). Parasympathetic, or PANS (pancakes on Sunday!), is in charge of essential bodily functions. The white blotches that sever the shoots reminded me of the synaptic cleft because there is actually a small space between the axon and the next dendrite where the neurotransmitters get transferred. Pharmacology, simply put, is always involved with our nervous system by altering, blocking, encouraging or imitating something.-JG, Student Pharmacy Technician

This painting looks like a Neuron: Depolarizing and releasing Dopamine. That is what I would name the painting. The dark circle base in the middle is the cell body. The longest arm extending is the axon. The smaller side arms are the dendrites. The dark color on the axon is the myelin sheath. The light spots between the dark spots are the Nodes. When the axon depolarizes, sodium ions move into the cell and potassium ions move out. In this case, the neuron is stimulated and the axon begins to depolarize. This releases dopamine which can then bind to a beta receptor. Dopamine stimulates the heart. This causes increased heart rate and strength of contraction. There is no constriction of the blood vessels. Dopamine will also increase blood flow to the kidneys.-MG, Student Pharmacy Technician

When I first saw the painting, Maldon, by Don Feasel, the thought of dendrites and axons came to my mind. The painting has lines of different thickness of lines that are connected and in certain areas are disconnected. Some of the lines had lines branching off in other directions. The lines resemble dendrites to me. It looks like it is floating around in the air like it would in the body. The places that are unattached look like dendrites that have been shortened because there was no activity or stimulation reaching them. There are some dendrites that look like they are re-growing because the ends are very thin but getting longer. After a period of time, dendrites will be shortened by "dying" and be broken down. The lines look like they have been pruned down to shorter pieces to show that there has been no activity reaching the dendrite for an amount of time. The dendrites will be recycled and absorbed in the body. Some dendrites are able to grow back with the use of antidepressants. The antidepressants will help by lifting the mood and creating stimulation in the body. This will help some of the dendrites grow back. It can take up to 4-6 weeks for the process to happen. When they grow back, it can help change the mood from being depressed to being happy. This is what the painting resembles to me.-LS, Student Pharmacy Technician



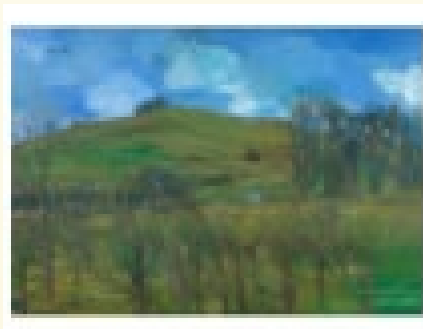
### Machiko Kondo, "Talk of Devils, Talk of Angels"

<http://www.artslant.com/global/artists/show/196640-machiko-kondo>

Machiko Kondo's, "Talk of Devils, Talk of Angels", made me think of what a person with Bipolar Disorder goes through. The antipsychotic drugs help with the illness but it never goes away and the person is constantly struggling with the two sides of themselves magnified by the biochemical abnormalities in the brain. I have a really old friend of mine from 40 years ago who is Bipolar/schizophrenic. I actually am not in contact with her anymore because of her disease. I tried for years to handle her episodes but in the end, it became abusive. This painting made me think of my friend & how trapped she must feel. I really enjoyed the show and pictured a lot of Pharmacological actions in the paintings. -MW, Student Pharmacy Technician

In this piece of work by Machiko Kondo called "Talk of the Devils, Talk of Angels", it reminds me of a psychotic disorder known as Schizophrenia. Where an individual may be delusional and or have auditory hallucinations. With persecutory delusions an individual thinks they are being tormented, tricked or ridiculed by an entity or force. With auditory hallucinations individuals hear a voice or two voices arguing like in this piece of art. Some possibilities for schizophrenia: this person had a blunt head injury as a child and has some kind of brain damage, has a strong genetic bio-chemical abnormality involving the production of dopamine and serotonin and its receptors. To battle this behavior individuals are put on medication. These are chemically related and called phenothiazines. These drugs exert their effect by blocking dopamine receptors, Thorazine, Haldol and Orap are just a few. If I were to name a new drug for my piece of art, I would call it "Talotheliongelzine". -FR, Student Pharmacy Technician

### Stephanie Sanchez painted the Orchard off Eastman Lane



<http://www.santarosa.edu/art-gallery/slideshows/faculty-2012/sanchez-02.php>

Stephanie Sanchez is one of the artists who painted the Orchard off Eastman Lane, and suggested that I use that and call it "Pepto Bismol" because she felt her mustardy-greens were a sickly hue. I disagree. I am not a painter, but she had mentioned that greens are a very difficult color to work with. I thought her painting was very beautiful. We can be our own worst critics. -EP, Student Pharmacy Technician

### Stephanie Sanchez, "Novato Wetlands"



<http://www.santarosa.edu/art-gallery/slideshows/faculty-2012/sanchez-01.php>

As I stared at the immense ocean drawn as a picture, it flashed me back to the time I used to go to build sand castles or to lose myself at the beach. When I glanced at this picture I was wondering what other useful materials the ocean offer us besides sea table salt and other comestible organisms that live within it. As a result, I decided to do a little research base on biomedical drugs that are created from organisms in the aquatic world. Researchers have recently discovered that toadfish is able to twitch muscles in its vertebrate stage. The toadfish is capable to vibrate its swim bladder muscle an astounding 200 times per second, two times much faster than a rattlesnake tail. Scientists, however, wants to study the toadfish anatomy and to apply the positive result to cure heart disease and to regenerate human nerve cells. This organism muscles can contract and relax at an amazing short period. This toadfish performance will provide clues to scientist on how to help injure human muscles of any kind. William Speck, a pediatrician who is currently the director of the Marine Biological Laboratory (M.B.L.), "I believe marine organisms can be used to eliminate disease and human suffering." He also mentioned "We now have the technology to visit the deep ocean floor, and, because of DNA technology, to more deeply understand life and ourselves." Researcher at the M.B.L. stated that biomedical researched began several years ago. I want to thank you for given me this wonderful opportunity to earn extra credits. You have a wonderful day. God Bless You - AE, Student Pharmacy Technician

### Joseph McDonald's, "Color Match"



The photo I choose to write about is Joseph McDonalds, "Color Match". It was a wonderful photo done with pigment print on film/light box. The photo was of this beautiful apple tree. It was full black and white, but the apples were still bright red. The first thing that popped into my head when I saw this photo was depression. I had the medical field on my brain while walking around and making comparisons. This photo for some reason just spoke to me.

My interpretation of depression is feeling down and sad, with only slight glimmers of hope. This tree is exactly how I look at depression and the feelings people must feel. The tree is dark and gloomy because it probably has reached its peak and fulfilled its duties for the season. The bright red apples are the few things left for it to bask in. There are so many branches that are saddened and wilted. The apples are scattered on the ground and throughout the tree, but are slowly fading. With depression, it seems that there is more sadness than happiness and with the tree; it seemed to me that there were many more branches down than bright and colorful apples. It was a beautiful photo that I would have loved to have purchased for my own home because it really spoke to me.-LH, Student Pharmacy Technician

I chose to write about the picture that Joseph McDonald created. You may be asking “how does this relate to pharmacology or anything to do with medication”? I saw Depression; the suffering is seeing the world this way.

Colorless with only a sight hind of color,  
 No motivation with only a glimpse of joy.  
 As time goes on this tree loses its fruit, goes to sleep and awaits next spring.  
 Just how a human being loses their strive and hopes that one day they wake up happy.  
 Some trees make it to Spring, but others don't.  
 Why the winter frost was too much to handle,  
 Just how for some of us life is too much to handle.  
 Therefore the lonely tree dies.  
 And just like that,  
 Untreated sadness will take your life.  
 - RM, Student Pharmacy Technician

A Place to be Free - As I browsed around the Art Gallery to observed all the beautiful arts, my eyes deeply focus at one particular picture. By just staring at this masterful piece of art, I noticed that the artist described nature in this picture. He drew an apple tree without leaves; most apples were lying on the dried grass. Based on the panoramic view of this picture, it seems it was a fall season, no tree had any leaf. When I first looked at this picture, it flashed me back to my wonderful childhood; it brought memories of the times I used to go into the forest. The times I had to climbed many different types of fruit trees such as mamon, anona, paterna, zapote, maranon, and wild grapes. The places I visited were like a paradise because of the different types of colorful wild flowers, the multicolored birds flying from one tree to another and the beauty of the shallow transparent river. This is how I felt, when I stared at Joseph McDonald's, Color Match 2010, and pigment print on film/light box). This piece of art, however, is related to pharmacology in many ways because this picture teaches us that humans have the need to nature. The forest could possibly free somebody from stress; it could possibly heal, and bring happiness. Many modern medicines are extracted from few natural sources. - AE, Student Pharmacy Technician

While looking at this piece of art, it's like looking at the cells of the nervous system. The small, white, twig-like branches resemble the dendrites and a number of red, round thing surrounding the branches are like the neurons or cells. Those are two of the many parts of the brain that are important during transmitting and receiving nervous impulses. -MTJ, Student Pharmacy Technician

In this photograph I see Depression. Here is the mind and possibly the heart in complete and utter surrender. There is no fight. It's cold, maybe damp, and dark. The tree is losing all its fruit. The fruit is the happiness within. This person isn't even aware that there is any happiness left inside them. There is no bloom, the fight is over. The tree can symbolize not only the mind, the heart, the will and spirit inflicted with depression, but it may also symbolize the literal matrix of the CNS. The branches may serve as the nerves and the apples are the transmitters falling by the waste side being absorbed and losing power of numbers.

It's as if the portrait is calling out for help. Something must be done. Someone must come to the rescue. How can this person be left alone to their fate. The tree is alone, overwhelmed with itself. Things have definitely gotten out of hand and at this point it's as if the tree is waiting for the rest of the apples, unbeknownst to it, to fall so that the tree can die. The tree doesn't see that sadness is a cycle and soon the sun will shine and the season will change and the fruit will come again. It's self-sabotage to the death. Yet through the sadness and the cold dark tone, there is a peculiar beauty in it. The artist has found a way to capture the despair in an almost romantic light, making you want to reach for the one you love and get warm, emotionally and physically. - MS, Student Pharmacy Technician

I absolutely loved this picture. The photo doesn't do it justice. With the backlighting it has an awesome 3d effect. Trying to relate it to something having to do with Pharmacology, from far away my first thought when I looked at it was that it looked like a network of nerves or I guess more specifically, a neuron with the dendrites branching out to conduct electrical impulses and send information throughout the body. At closer inspection of the picture it turned out to be a beautiful tree in black & white with red apples all around it. I found that kind of fitting since in my head I associate apples with being the fruit of life which kind of ties in with what we're learning. - MM, Student Pharmacy Technician

Donna Larsen, Urban Landscape 2 MacDougal Street and King Street, NYC installation, 2012 Inkjet photo on paper



<http://www.santarosa.edu/art-gallery/slideshows/faculty-2012/larsen-02.php>

The link above is for the image that I loved. I have visited the art gallery three times since the instructors here have placed some of their pieces. These pieces, by Donna Larsen, remind me of my grandmother and her struggles with schizophrenia. Donna Larsen's pieces remind me of this disease because the picture although complete has pieces of other pictures and things that show through. When I was little my mother tried to explain it to me like this- imagine having all the pieces of the puzzle but the puzzle never seems to go together right. Maybe you hear things later than when they were spoken, maybe you picture things that aren't there etc. So these pieces of artwork remind me that because all the layers of the original pieces are there they're just changed or distorted from people tearing them down and replacing them with new pieces.

My grandmother takes risperidone for her schizophrenia and a handful of heart medications such as carvedilol and Lisinopril. She is also takes simvastatin (anti-hyperlipidemic), Loratadine (allergies), People with schizophrenia usually take medications to help with manic symptoms like Lithium, Valproate Semi-sodium (depakote), Carbamazepine (Tegretol) and some form of antidepressant (SSRI's) such as Prozac, Zoloft, Limotrigine. If Warfarin wasn't already taken as a drug name for the heart- that's the name I would give an anti-psychotic. Because it seems as if the body is at war with itself. Nothing wants to fire right and the body gets misinformation.- JK, Student Pharmacy Technician



Everything about this piece stood out to me. The way the white lines went crazy on the canvas and the way they got brighter then darker. From the moment I looked at it, I thought of the brain. The way our brains work in such a complex way just as this piece of art leads to many different destinations on the canvas. Than as the red dots began to stand out more and more to me everything in my brain began to work. The red spots were no longer part of the art piece, but part of our brain. Each red dot represents a different part of the brain; perception, motor, attention, old memories, thinking, emotions, and etc. Just as the red dots weren't just part of the painting, but much more to the artist they gave the painting color when all there was bright and dark. The dots had purpose, just as every part of brain has a purpose a reason for being there. So when we look art, we can connect the dots. -CI, Student Pharmacy Technician

### "Shadows Coming Through Screens" by Machiko Kondo

<http://www.artslant.com/global/artists/show/196640-machiko-kondo>

The piece of art that I picked is called "Shadows Coming through Screens" by Machiko Kondo. It looks to me like someone is diagnosed with schizophrenia. This piece of art works for me for a couple reasons. Auditory hallucinations as someone may be hearing voices and delusions that these voices are here to do them harm or perhaps have them do harm to others. I picture them cowering in a corner, frightened with nowhere to run because the shadow entities are right there. The treatment that I would recommend is an antipsychotic medication. This suppresses dopamine and sometimes serotonin receptor activity. I would call this medication "shadcothroupomine".- FR, Student Pharmacy Technician

### Renata Breth, from "ZULUZEIT" Untitled, 2011, Pigment print from scanned negative



<http://www.santarosa.edu/art-gallery/slideshows/faculty-2012/breth-01.php>  
<http://renatabreth.com/>

'On the Wings of Angels' floated into my mind when looking at this piece by Renata Breth from "ZULUZEIT". How beautifully our bodies take care of us in the dying process. As the cell's life fades, natural endorphins bind to opiate receptors to block pain. GABA and glutamate, the neurotransmitters designed in a delicate balance, shift to create an effortless sedative-hypnotic, peaceful haze. Electrical impulses from the Sino Atrial Node (the Seat of the Soul\*) are slowing, gently fading. Neurochemical signals to and from the brain follow in the dance. As the brain stem is bathed in an innate cocktail, our Essence is released. "All that must be remembered, is birth is not the beginning and death is not the end." \*-TR, Pharmacy Technology Program; \*Our teacher, Diana, Pharmacy 101-Fall 2011

## Butterfly Dreams by Joseph McDonald

In his painting, McDonald depicts a woman's mysterious image separated between two different worlds. Her lonely physical half sits on the window, but her lost mind wonders far away from reality. All her essence aspires to belong to another world of beauty, wild nature, love, peace and harmony. The soft breeze sifts through her gossamer dress and her curly red hair streams around her sensual body. The whirl of multicolored butterflies dances around her thoughtful image inviting her to join their roundelay. She feels so light and fragile; she fantasizes that she turns into a huge golden butterfly and flies away from every day's boredom to a dream world where she is enveloped in transparent lace attire. She dreams to dive into a warm ocean of orange flowers, where she can suck the magic nectar from exotic plants.

McDonald's painting can be interpreted from a pharmacologic perspective. An inference can be drawn that his subject, a young woman with butterflies, has imbibed the hallucinogenic drug Lysergic acid diethylamide, or LSD. This drug has heightened her senses and allows her to immerse herself in radiant glows of light and beauty. She feels completely connected to nature which gives her overwhelming euphoria. These hallucinations allow her to travel through the cryptic labyrinths where she can encounter the bright light of novelty and sense of life. She imagines herself hiding in a warm yellow cave and rolls herself into a cocoon of the magic butterfly to feel safe from the threatening world she left behind. LSD has taken this young woman on a very special adventure or "trip." Her state of mind and sense of self have been altered. Her emotions, senses, spatial connection, and memory have all been accentuated. The psychological effects can be dramatic: one can lose themselves in their environment and cause a loss of ego. -LK, Student Pharmacy Technician

The artwork that I really liked was on film/lighthouse and it was of different butterflies, but also the side view of a nude woman. The name of the artwork was "Butterfly Dreams", by Joseph McDonald, 2010. The picture immediately made me think of Lunesta (the commercial/association) for the sleep-aid or sedative hypnotic. If I were to name this artwork as a drug, I would name it "Morning Glory" after the butterfly. I think there is either a morning glory or mourning cloak butterfly. Its advertisement would read something like this: "wake up gloriously refreshed, with no hangover, energized & ready to make all your dreams come to fruition." - EP, Student Pharmacy Technician

Much of modern pharmacology is based on the natural world-plants, animals, biological systems. Indeed, to understand the human body, its chemistry, anatomy, physiology, etc. requires an appreciation and knowledge of nature. In order to treat disease, we must always be mindful of the role that other living systems have on human life. For example, to treat cancer, the immune system is often compromised and a person can very easily become victim to invading microorganisms such as bacteria or fungi. The delicate balance of life and death is always at play. I think this artistic piece illustrates nature quite well. - JH, Student Pharmacy Technician

When I see this portrait, the first thing that comes to mind is Alzheimer's Disease. In other words, Dementia. You can see the beauty that once was. The sound mind, able to make sense, remember, and fully function. It's now in ruins, but you can still get glimpses of beauty, sometimes more than others. The disease is gradually aging, just as the person ages. The artist has given the piece of art an "aged" look, just like the disease is forcing an unnatural kind of aging to the patient. The disease and the patient are going through a transformation together, one getting

weaker and the other getting stronger. The butterflies fade and the ruin grows. Yet there is still the presence of the butterflies, showing that there was once so much life and the possible inner struggle to stay alive, but the disease takes hold and is tarnishing the integrity of the mind. The colors fade and the picture is fading into a very bleak representation of the new reality. It's as if the artist is saying goodbye to life, but in a fighting way, still acknowledging the remaining life within. ~ MS, Student Pharmacy Technician

### Above Turtle Pond by Marsha Connell



<http://www.santarosa.edu/art-gallery/slideshows/faculty-2012/connell-02.php>  
<http://www.marshaconnell.com/>

This picture has beautiful flowers resembling poppy flowers. From the poppy we get *Papaversomniferum* which is used to make pain relievers of the opioid analgesic class. Some of the effects of opioids include euphoria, pain relief and respiratory depression. Opium is not just a drug used in the medical field. It is also used on the street and is highly addictive. On the street this drug is typically smoked and creates a feeling of high euphoria. Side effects include drowsiness, respiratory depression, constipation, nausea, and mental cloudiness. ~ TJ, Student Pharmacy Technician

### Wildflowers Heaven by Marsha Connell



<http://www.santarosa.edu/art-gallery/slideshows/faculty-2012/connell-03.php>

This is one of the paintings I saw displayed in the art gallery. When I first saw it I didn't automatically think of a field with a broad range of colors, which most of my friends saw, but I saw what could be the brain of a human. For me, the painting seems a bit out of focus so it could be a picture of someone with a concussion. Usually a concussion results when someone hits their head either from falling, a sports activity, and car accidents. This causes significant movement of the brain and causes you to lose alertness and become unconscious. Some symptoms of this concussion could be memory loss which is caused by an interference of several parts of the limbic system. Another symptom of a concussion is a headache which is the pain caused by the disturbance of the pain sensitive structures around the brain. There are nine areas of the brain and neck that have these pain sensitive

structures which are the cranium, nerves, arteries, muscles, subcutaneous tissues, mucous membranes, sinuses, eyes and ears. The treatment of a headache usually involves analgesics which are more commonly used as painkillers to the public. They include acetaminophen and NSAIDs. Drugs like these act in various ways on the peripheral and CNS but even though the exact MOA of acetaminophen is uncertain, it seems that it acts centrally rather than peripherally. -LR, Student Pharmacy Technician

Euphoria - Marsha Connell's Wildflower Heaven (2009) is an oil on canvas picture of what appears to be a valley or a hillside at midday. The oil effect gives the image a smudgy yet pleasing sensation to the eyes. As soon as that connection was made, euphoria came to mind. Euphoria, opposite of dysphoria, is when a person feels positive moods such as happiness, ecstasy or joy. While euphoria can be used to define a natural emotion, it's generally exaggerated. Euphoria can very well be an effect from mental disorders and or use of drugs. Different kinds of stimulants, opiates, opioids, depressants and hallucinogens all can cause euphoria when administered. Euphoria is triggered by dopamine or norepinephrine, which are increased by the use of methamphetamine for example. Why dopamine? Dopamine is responsible for many functions and behavior including, voluntary movement, motivation and the reward/punishment system. Meth inhibits the reuptake of dopamine but replaces them, causing the receptors to work in reverse. This makes the person feel an intense flow of euphoria, but actually causes dopamine levels to drop. When dopamine levels drop, the user will want to take more meth to "restore" the euphoric feel and continue to deplete his/her dopamine levels. It is very difficult to return back to normal dopamine levels. Euphoria is also triggered by opioid receptors. More specifically, the mu 2 ( $\mu_2$ ) receptor.  $\mu_2$  is part of the mu receptor group, which is a major subtype along with delta, kappa and nociception. -JG, Student Pharmacy Technician

### Winter Solstice by Marsha Connell



<http://www.santarosa.edu/art-gallery/slideshows/faculty-2012/connell-04.php>

When I first saw this painting the branches of the tree reminded me of blood vessels. The colors in the painting, however, make it seem like something is dying and beginning to deteriorate. After looking more at the painting it reminds me of gangrene, mainly in the middle region of the picture. Gangrene is caused by infection by a certain type of bacteria named *Clostridium perfringens* or by thrombosis which is a blocked blood vessel. In this painting the gangrene could be caused by thrombosis because the top part of this picture has what looks like blood vessels that are bigger than normal which is therefore a result of a blockage of the blood vessel. This seems to be more of what is called dry gangrene. Because of the cause of dry gangrene is a lack of blood flow, restoring blood supply is vital.



The bottom of this painting has a dark reddish black color that when it comes to gangrene is due to liberation of hemoglobin from hemolyzed red blood cells that is acted upon  $H_2S$  produced by the bacteria and results in a formation of black iron sulfide that remains in the tissues. Surgery is more often than not an option when it comes to gangrene. However, antibiotics could also be used to help cure gangrene if there isn't a lot of damage already. Antibiotics work by killing or slowing down the growth of bacteria. The successful outcome of the antibiotic use depends on the host defense mechanism, the location of the infection, and the pharmacokinetic and pharmacodynamic properties of the antibiotic. One would have to go to the doctor to get this checked out and diagnosed because they would have to know the bacterial growth phase and it requires ongoing metabolic activity and division of bacterial cells and one finds these by doing laboratory studies. - LR, Student Pharmacy Technician

Marsha Connell titled "Winter Solstice- Pepperwood." It looks like a hill with dark trees and branches on top. It consists of autumn colors such as soft tones of orange and yellow and the dark trees are the contrast. I chose this painting because it reminds me a lot of how synapses look. The trees look like the synapses and the hill makes it look as if it is an entire axon. On the trees there seems to be a thin layer of color outlining them and I believe that is the myelin sheath cover that protects the axon. Overall, the painting reminds me of our lesson in the control of body functions and how neurotransmitters are chemical messengers. It also brings up the larger picture of our systems such as our nervous system and how it has different bits and pieces that control different actions, such as our Autonomic and somatic systems. - JV, Student Pharmacy Technician

### Be What You Are, 2011 Oil/Canvas by Sandra Cohen

<http://www.sandracohen.com/artist.html>

This image I had chosen in particular because I believe the artwork "Be What You Are" by Sandra Cohen at the art gallery can be supplementary to pharmacology. The work can be perceived as a representation of GABA neurotransmitters that are complex clusters composed of separate units located in the central nervous system. The image is a complete depiction of how Benzodiazepines relieve anxiety and symptoms of insomnia. Once Benzodiazepines are able to initiate their effect on the CNS they are able to enhance the affinity of the GABA receptors that are stimulated. The painting is an excellent visual of how Benzodiazepines increase the central nervous systems inhibition. In view of the portrait "Be What You Are" by Sandra Cohen is an excellent metaphor that are related to the concepts studied in Chapter 8 of our text. For that reason this artwork is a concrete illustration of how GABA receptors function and their responses they have in the CNS. - AR, Student Pharmacy Technician

When looking at all the beautiful art in the art gallery, Lisa's piece stood out to me right away. The dark and light contrast is what really made it pop out compared to many of the other art pieces in the gallery. She took a dark background and subtly added light shades of pinks and yellows to catch the observant eye. As I began to look closer at the piece, I began to see the way it related to pharmacology. By sectioning off each piece into its own mini piece remind me of the 3 suppressor pathways; endorphins, serotonin, and GABA. Each pathway is working its way into the brain to accomplish something different; to stimulate a different reaction in the way that a person's mood can change. Just like each piece had different light shades in different designs setting off the dark background. Showing each brain begins the same (dark background), but then changes has events in our lives change it (light shades). - CI, Student Pharmacy Technician

## Oh La De Da, 2011 Oil/Canvas by Sandra Cohen

<http://www.sandracohen.com/artist.html>

I choose this image because to me it clearly exemplifies how The Tricyclic Antidepressants work for treating depression. I can relate this painting to pharmacology and to the concepts that were studied in Chapter 11. The image can be perceived as a metaphor illustrating how TCA's block the reuptake of norepinephrine and serotonin in the brain that are intended balance or to restore the quantity of neurotransmitters that are located in the synapse of the brain. Antidepressants are medications that need to take several weeks in order the patient to see a difference and this painting show how the process is achieved in the brain. The portrait is detailed showing how TCA's stabilize neurotransmitters levels to a normal balance in the brain.

When a patient has depression the reuptake inhibitors in the brain block the neurotransmitters from being able to reach proper point in the synapse. This causes the postsynaptic neurons to be reduced. That is why the patient will experience symptoms of depression. Antidepressants help by stabilizing this imbalance by enhancing the stimulation in the postsynaptic neuron that is then able to relieve symptoms of depression. That is why I choose this artwork in particular because the image to me shows the concepts in pharmacology of how SSRI and TCA's work in the brain. - AR, Student Pharmacy Technician

Central Nervous System: his picture resembles to me the cloud of neural transmitters being released from the end bulb of the axon into the synaptic cleft. The different colors represent the different neurotransmitters, acetylcholine, biogenic amines, histamine and serotonin. This is where prescription drugs do their work, binding to receptors, inhibiting reuptake of neural transmitters and blocking other neural transmitters. This process is the "meat and potatoes" of our body's nervous system. Without this we could not survive, processes that are beyond our thoughts would not take place. Our body temperature would spiral out of control, water balance would be disturbed and respiration would not happen, leading to death. -TJ Student Pharmacy Technician

The 'Oh La De Da' is small, free form oil on canvas -- a mixture of flowing pinks, yellows, and oranges; it seemed in contrast to the Boxer illustration. The two equally caught my attention. The oil on canvas for its simplicity, ease of movement, sense of freedom, and relaxed expectation; as I gazed at this painting, it reminded me of the how most of the time we do not think about all the intricacies of our bodies but take for granted how all the systems just work in a carefree existence of diffuse and non-specifics of life energy. -CC, Pharmacy Technology Program

Oh La De Da" by Sondra Cohen. This painting looked like a fusion of purples, yellows and orange. In a way it looks like a swirl of frenzy with all the different colors and the dark purple background. I chose this because it made me think of chemical reactions in the body when drugs are taken. It made me think of the negative reactions in the body when a drug is taken and possibly overdosed on. It also made me think of the effects drugs have on people's mental processes when they take a controlled drug when they do not need to such as hydrocodone or other opioids. There are many complications that can occur with controlled drugs and I think that when you see this painting and that swirl of frenzy it represents the pleasure people receive when taking drugs when they are not supposed to and then the trouble the body goes through when someone overdoses. I feel as though it also represents the whole process a patient may have to go through in the hospital when it comes to emergency visits, procedures and just their personal fear of what could happen next. -JV, Student Pharmacy Technician

### Hiroshi Fuchigami, Untitled, 2011, Porcelain Ceramics



<http://www.santarosa.edu/art-gallery/slideshows/faculty-2012/fuchigami-01.php>

The Hiroshi Fuchigami porcelain ceramic can be related to pharmacological history and man's motivation to self-medicate. It reminds me of an exquisite smoking vessel that could have been used hundreds (or thousands) of years ago. Opium has been used historically for as a potent pain reliever. Recreational use can be traced back centuries. Its use in western medicine can be traced back to the mid 1500's. Anthropologists have concluded from ancient burial sites that opium was used in rituals and was believed to have healing powers. -TT, Student Pharmacy Technician

The Seed-1 porcelain sculpture by Hiroshi Fuchigami gave me a sense of peace and wisdom. It is an oval shape sculpture with an opening where a head of a Buddha is carved inside. When I read the description of what the sculpture is supposed to represent, the words wisdom, potential and "wake up" popped out. This immediately made me think of the pharmacy technician program. Each person taking this program made a choice of enriching their lives with wisdom and has the potential to make a difference in the world. The description of the art also talks about the empty space in the sculpture and how it gives the idea that wisdom lies sleeping. When I first took pharmacology 150, I had no idea what to expect and what career path it will take me. After finishing up the first half of the program, I am starting to get a better understanding of what role a pharmacy technician plays and the oath that goes along with the job. The seed that was planted in Pharm 150 is now starting to sprout leaves and soon some flowers. What gave life to the plant are the classes and the hands on experience in a real pharmacy. Knowledge that was obtained in the classroom will be used to apply in the pharmacy. In the last half of the program I am still finding myself learning new things and I will continue to fill the empty space as I pursue pharmacy school. -CP, Student Pharmacy Technician

### Poppy Leaf Earrings by Linda Weiss, 2011



<http://www.santarosa.edu/art-gallery/slideshows/faculty-2012/weiss-01.php>

I went to the Art show on Wednesday and took some time to look at some really good pieces of artwork. After some browsing I was able to spot out some paintings that I could relate to the topic of pharmacology and pharmacy. One was some earrings that were on display with other jewelry, made by Linda Weiss the title was "Poppy Leaf Earring". These earrings had poppy flowers on the design! The chapter we read about opioids was one

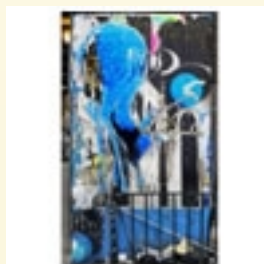
of the chapters I enjoyed reading and admire the poppy plant for how beautiful it looks. It's strange that such a plant can have some powerful therapeutic properties, because these natural plants can have such an impact all over the world in different countries. Very nicely done!- BC, Student Pharmacy Technician

There were so many Art pictures on the shelves and on the wall and I was looking all around which was very beautiful, but kept looking at the display of jewelry. I saw this poppy leaf earring it reminded me what was on my mind, which is relating the topic to pharmacology. One chapter that was similar was the "Opium poppy", made by Linda Weiss the title was "Poppy Leaf Earring". I read this chapter about opioid Agonist and how the poppy plant works for body pain relief. Even one small poppy plant is a powerful plant which people can make pain medicine. It is used for body pain relief such as tectite stimulation, cold packs, acetaminophen and local anesthetic etc.- GM, Student Pharmacy Technician

There are so many pictures. I just looked at all of them. They are really good and colorful pictures. After that I thought I could relate these pictures with the topic of pharmacology, and pharmacy 155. I choose the "poppy leaf earrings". These are beautiful to wear. These earrings have two colors, one is silver and other is yellow and design, styles. They remind me the leaf of opium poppy. Poppy is one of the most important medicinal plants. Poppy has been used against toothaches and coughs. The ability of opium from poppy to serve as an analgesic is well known. The resin of the opium poppy *papaver somniferous* provides humankind with our potent pain relievers.- JM, Student Pharmacy Technician

The Seed-1 porcelain sculpture by Hiroshi Fuchigami gave me a sense of peace and wisdom. It is an oval shape sculpture with an opening where a head of a Buddha is carved inside. When I read the description of what the sculpture is supposed to represent, the words wisdom, potential and "wake up" popped out. This immediately made me think of the pharmacy technician program. Each person taking this program made a choice of enriching their lives with wisdom and has the potential to make a difference in the world. The description of the art also talks about the empty space in the sculpture and how it gives the idea that wisdom lies sleeping. When I first took pharmacology 150, I had no idea what to expect and what career path it will take me. After finishing up the first half of the program, I am starting to get a better understanding of what role a pharmacy technician plays and the oath that goes along with the job. The seed that was planted in Pharm 150 is now starting to sprout leaves and soon some flowers. What gave life to the plant are the classes and the hands on experience in a real pharmacy. Knowledge that was obtained in the classroom will be used to apply in the pharmacy. In the last half of the program I am still finding myself learning new things and I will continue to fill the empty space as I pursue pharmacy school.-CP, Student Pharmacy Technician

### Urban Landscape 1, W Houston and Macdougall Street, NYC by Donna Larsen



<http://www.santarosa.edu/art-gallery/slideshows/faculty-2012/larsen-01.php>



Another piece of art I liked was the one with deer's on it by Donna Larsen, it was more of an abstract piece but it reminded me of something maybe someone who was on some sort of hallucinogen would experience seeing. When the brain is introduced to hallucinogens, sometimes people see things that aren't there, or they see things that are more detailed, they see more colors and sometimes euphoric. The background seems to be of some sort of train station with various designs plastered over, the deer almost looking evil in a way, maybe it's a "bad trip" experienced by some. On LSD, PCP or even marijuana for example, one can experience a loss of time, and a heightened sense of visuals, causing some to see things that aren't there. I feel that way about this last painting that I saw that caught my eye. -BC, Student Pharmacy Technician

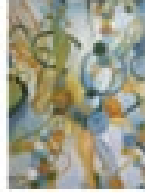
A piece of art, which is really liked, was one picture with a deer on it. As I watched and photographed, I saw how works were rapidly and continually pasted over by other artists as well as worn down, ripped off and written over by Donna Larsen. It was more of a nonfigurative piece but it reminded me of something chapter 10. The topic name of hallucinogen would experience seeing. The brain function is hallucinogens; people can see things sometimes but the mind isn't on same the page. They can see more pictures, colors and thinking. On this picture a deer is looking wickedness in a way, a deer is going die soon. The deer can be causing by any disease from die that I find it. -GM, Student Pharmacy Technician

Glancing at this piece of art is like looking inside the mind of a human, experiencing depression, a psychiatric disorder. Because of a lot of expressions in the art, it's like an alternating episodes happening inside the brain of an affected person. The colors white and blue, represents the range of mood from normal to sadness, which are considered the symptoms of depression. -MJT, Student Pharmacy Technician

This picture is very intriguing. At first glance I just saw it as chaos and abstract but the more I looked at it I was able to see the deer and the fence, maybe the moon and forest? This one reminded me of the project we did last semester on our interpretation of sans & pans. There's the abstract or chaotic part, which would trigger the sympathetic division, increase heart rate, blood flow, glucose and trigger the fight or flight response to whatever was causing the chaos. The other view of the picture, the peaceful, calm deer, the forest, fence, moon, that is the parasympathetic division. Just maintaining essential body functions required for life. Since organs receive input from both systems and the actions tend to oppose each other you can compare that with the way you look at the picture and either see the abstract chaos or if you see the deer and the forest and fence. -MM, Student Pharmacy Technician

When I first saw this piece as I walked in the gallery I taught to myself "damn", that painting look just like the street corners of New York. You don't know but in New York where the subway stations are there are little iron gates just like the one in the painting and a lot of graffiti and garbage on the floors just like in the painting. As I walk up closer to the painting I see that it was done by Donna Larsen, and the title of the painting is "New York City Installation 2011, what a coincidence, huh. This painting reminds me of the loop of Henley in the Urinary system with the big loop at the top. I was confused at first as to what the painting was until I bend my head down as to look upside down to notice it was a deer in the picture. I like it reminds me of home. I read the artist statement to see if she was from New York or maybe even visited there; but, she didn't mention anything about having been there; I guess she is an artist to have captured a place so well she. -DM, Student Pharmacy Technician

## Lisa Beerntsen, "Wonder"



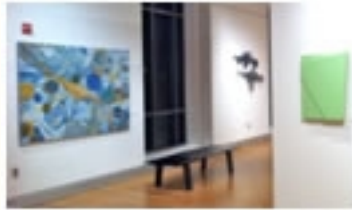
<http://www.santarosa.edu/art-gallery/slideshows/faculty-2012/beerntsen-01.php>

As I look at this piece I found that in the background is muscle fibers. There is also red blood, and white blood cells strewn about as though they are delivering what the muscles need. The hexagon shaped objects could be nutrients in flowing in the plasma. Some chemicals are broken down by the liver and is going to the nerve receptors. They will bind or block the nerves that are connected by the Axon of presynaptic neuron. The neuron would be at the center to bind or be blocked by the hexagon groupings of chemicals of drugs that the patient took. It also shows that the Neuron has a nucleus in the center and branches to other nerves. The axon attaches to the muscle. The colors also have an undertone of blue with green that represent peace and healing. The orange to me would represent the microscopic possibilities that are going to be treated to heal the body. I find that I can see a lot of depth from the artist, in my case to look for something to relate my life in her painting I feel that I have. - CR, Student Pharmacy Technician

Vessels, Nerves, Viscera, Oh my! - This image grabbed me from outside the gallery as I was shaking the rain off of my coat. I was certain this was one of the ones that would have caught the instructors attention. Being a huge fan of human anatomy, I have spent my fair share of time inside cadavers seeking an illustrated understanding of the parts inside and how they work together. In this artwork I saw DNA, cells, nerves, vessels, muscle fiber and so much more.

Since we are connecting art in the context of pharmacology my mind wandered to all of the different compartments of the human body: blood, fat, muscle, lymph, organs. Medicines are engineered and designed to get to the compartment that is best suited for successful administration. A pill for pain in your foot must find its way to the central nervous system where all pain is perceived. Medicine for swelling or anti-histamine would need to find its way into the blood. A diuretic needs to exert its action on the kidneys where urine output and blood volume is controlled. This painting very beautifully represents, all of these compartments are so closely 'housed' together. Pharmacology is precisely targeted as to ensure the right drug in the right place. Nerves run right along blood vessels which run alongside and into tissues and organs and yet they are all separate entities like members of an orchestra; disparate in sound and tone but together creating beautiful music. - BS, Student Pharmacy Technician

## Lisa Beernsten, "Twist"



<http://lisabeerntsen.blogspot.com/>

"Twist 2011" by Lisa Beernsten was another piece of artwork that I liked. Like the title suggests, it is full of abstract twisty things and circles. This can go both ways for me. First it can be a feeling of being disoriented by therapeutic effects of a drug, and has almost a dizzy feeling to it, that's how I feel anyway! And also it mimics the ideas of cells and neurotransmitters sending signals in the brain. A constant jungle of information being transmitted back and forth, a design that even looks like a synaptic cleft, the circles representing signals being passed. It was pretty interesting because coming to the art show, I didn't think I would find any pieces of art that would remind me of pharmacy or pharmacology for that matter, but I ended up finding these 3, and a few others that got me thinking! All of the art was good and I had fun going with friends to see this art show on a day that I wasn't completely busy with work, volunteering or going to school!! Good extra credit assignment and I wish we can do more like this. - BC, Student Pharmacy Technician

I really liked this one which is "Twist" by Lisa Beernsten. The topic seems full of meaning twisty things and circles each other. This picture reminds me of pharmacy and pharmacology and how people can be thinking, feeling of being confused by therapeutic side effects of a drug, a dizzy and confused. It mimics the ideas of cells and neurotransmitters sending function into the brain. The circles are representing signals being brain passed. It was very interesting art show because I felt that art makes me feel emotion and thought and how people can draw a piece of art on the paper to create happy, joy. I learned from the art show which is my feeling and thoughts. - GM, Student Pharmacy Technician

First impressions: As I sat on a small but comfortable sofa at the art exhibit to take in this piece, the words 'structured chaos' seemed to describe what I saw here and as I let myself think 'Pharmacology', I thought "so this is what pharmacokinetics must look like". Yes, all the greens, blues, blue-greens, gold's, mustards, neutrals and whites. A large work of colorful shapes and various dimensions, all subjected to seemingly random yet orderly placements on the canvas, the orderly processes of ADME.

The striated ribbon-like forms that flowed from outer edge to outer edges and/or disappeared behind other objects in the painting, now transformed into the bloodstream. I mentally added a drug and now I had set the painting into motion. Absorption into the bloodstream could now be accomplished. The process moved quickly into the surrounding tissues. The distribution seemed apparent as many of the cellular-type shapes were touching anyway. Many of these shapes were very reminiscent of diagrams of cells – either being circular or having organically irregular roundish shapes. Some of the more organic shapes even having a defined area surrounding their edges that looked like a cell wall. So, I then could 'see' receptors further allowing the distribution process to continue. How the receptors got chosen seemed to be part of the magic of colors and sizes of the imagined tissues. Knowing that their unique structure had to do with who or what got accepted where.

But what about the biological changes referred to as metabolism? I had no doubt that every process in this 'twisted organism' knew how to handle any incoming nutrient or drug. It was 'fun' assignment and helped solidify some concepts for me! Thanks-CC, Pharmacy Technology Program

I was impressed with the creative variety of the exhibition. There was one particular painting that attracted my attention as a pharmacological representation. "Twist", an acrylic on canvas by Lisa Beerntsen, appeared to me as an infectious battleground within the body. On the left of the canvas appears a brown, cilia-covered bacterium that is under attack by the immune system. The blue spheres with the complex surface pattern appear to be antibodies and the irregular shaped entities resemble macrophages ready to destroy. The twisted fibers could be either muscle or nerve tissue. There are several simple-shaped particles that could be antibiotic molecules that have joined the fight. There was another canvas, "Wonder", also by Lisa Beerntsen that had a similar theme and look. I really enjoyed the exhibition and this extra-credit project. - PS, Student Pharmacy Technician

I walked through the whole art exhibit and looked at every art work that was displayed. I tried to find something that popped up to me and related to pharmacology. Toward the middle of the room on the left when you walk in there was a big blue painting on the wall that looked a lot like an opioid receptor distribution in the brain because of the so many things occurring in the painting and all the colors. The name of this painting was "Twist" and the artist who created this piece was Lisa Beerntsen. Not only did this painting remind me of opioid receptors but it also looked like the release of norepinephrine in the adrenergic neuron because in the painting it looked like there was a release of some sort and the little circles and other shapes were floating around. The painting can also relate to how medication can flow into the body in my opinion. -TT, Student Pharmacy Technician

"Twist" painted by Lisa Beerntsen. The reason I choose this piece was I felt like it was almost an exact comparison to the chapter in our book regarding the Automatic Nervous System and Cholinergic Agonists and Antagonists. In the painting, there were different shapes and sizes of objects kind of floating around in an area. Some seemed to be connecting, or acting together, and some were completely separate and individual. They reminded me of different receptors, neurons and cells. There was a long twisted, two-toned ribbon flowing through the painting and it reminded me of the CNS of the central nervous system. There were also what looked like blooming flowers, or the cholinergic receptors in the part of the parasympathetic nervous system reacting and the body reacting and physiologic changes happening. Surprisingly, looking at this picture was quite calming. I enjoyed the subtle, yet at the same time intricate work of this artist and it was a piece that I got lost in. - LH, Student Pharmacy Technician

"Twist" by Lisa Beerntsen This painting embodies a whole lot of little, different molecules working together as one. They are all working together to achieve a desired effect. Some of the objects in the painting are blue colorful balls with smaller particles inside. There are also pentagon-shaped particles within that reminded me of drug receptors. The main part that drew me to this painting was the main chain in the middle that twisted around and looked like it brought everything together.

I would name this new drug Differenex because it really is different from all the other type drugs out there. In my imaginary mind, it would finally be the drug to cure Alzheimer's disease. With all its complexity, Differenex offers something totally new and revolutionary to the pharmacy and into patient's hands. This drug would mend and bring back to life the parts of the brain that had deteriorated because of Alzheimer's. Unfortunately, some of the



side effects would include hallucinations, dizziness, and nausea because Differenex is changing so many different parts of the brain. -KA, Student Pharmacy Technician

The art piece by Lisa Beerntsen titled Twist, caught my eye. It is an acrylic on canvas. The painting looks like an image inside the body. The objects are different shapes, sizes, and colors. The objects resemble different cells in the body. They look like red and white blood cells, neurons, DNA, drugs and more floating around in the body. They appear to be in movement and trying to attach it to different receptors. Some of them will fit in certain receptors and will or not have an effect on the body. The ones that have no effect will attach itself to a receptor taking up space. These are considered as agonists or antagonists depending on their end results. The agonist is a hormone, neurotransmitter, or a drug that triggers a response by binding to specific cell receptors. An antagonist is a drug that neutralized the effect of a substance on the body. The receptors have specific shapes, so the drug with the shape can fit. There are times when a drug will fit, but will have a partial effect on the body. They have an agonist and antagonist component to them. -LS, Student Pharmacy Technician

### “Holding On” by Joel Bennett, Burnished Pit Fired Ceramics, 2007



<http://www.santarosa.edu/art-gallery/slideshows/faculty-2012/bennett-01.php>

There was this beautiful vase. The artist who created the vase explained how he used different types of chemicals to create the beautiful colors of the vase. He applied different chemicals on the surface before baking it. Once the vase is put in the oven, each chemical will react differently to heat and fire and turns different colors. He used one chemical to create the beautiful blue colors on the vase and another chemical to create the orange pastels. When I read about how the vase was created it reminded me of how different drugs that enter the body react differently based on drug classifications. For example, nicotine is a cholinergic agonist, and it binds to the cholinergic receptors where it causes a response. Phenylephrine is an adrenergic agonist and has a strong affinity to the adrenergic receptors. It affects receptors in the sympathetic nervous system. -MK, Student Pharmacy Technician

The two main areas of concentration with Joel Bennett is Burnishing and pit-fired ceramics, and yet in pharmacology we have pharmacodynamics and pharmacokinetics. The former studies the effect of the drugs on biological systems, and the latter the effects of biological systems on the drugs. While in broad terms, pharmacodynamics discusses the interactions of chemicals in the biological receptors. Pharmacodynamics is a study of the biochemical and physiological effects of drugs on the body or on microorganisms or parasites within or on the body and the mechanisms of drug action and the relationship between drug concentrations.

Just like ceramics involves burnishing, pit-fired ceramics processes to get advanced response, so is pharmacology with pharmacokinetics and pharmacodynamics that deal with drugs that interact within biological systems to affect function. Ceramics are pit-fired and burnished to create a beautiful art piece. So is pharmacology, which is a

branch of medicine and biology concerned with the study of drug action. More specifically, it is the study of the interactions that occur between a living organism and chemicals that affect normal and abnormal biochemical function. - IK, Student Pharmacy Technician

### “Gestural Narratives” by Alan Azhderian



<http://www.santarosa.edu/art-gallery/slideshows/faculty-2012/azhderian-01.php>

I found this picture very interesting to me because it has many images of people and they seem to be dancing in different styles. Whenever I see this art it reminds me of those signs and symbols posted in different pharmacies or other medical centers to make people cautious of particular disease or to provide other information for public. There is similar kind of art in our practical pharmacology book in chapter 10, figure 10.3 which also has different images or arts in a single art. It's a decorative blotter paper, used to deliver multiple doses of LSD.~ JM, Student Pharmacy Technician

Azhderian did a great job explaining how he came up with this wonderful artwork. He said, “Immediately I began to see figurative elements fitting together”. It's like how most drugs work. The pieces can be seen as the receptor and the neurotransmitter. They bind to each other and produce a therapeutic effect. In Azhderian's case, those pieces produced an interesting artwork.~JT, Student Pharmacy Technician

I wavered back and forth in whether or not I should use this picture for my extra credit because it doesn't remind me of anything from our book but it's really stuck with me so I decided to use it anyways. When I looked at this picture it reminded me of the guest speaker who came in and talked to us about HIV/AIDS. You figure when you have sex with someone you're not just with them but everyone else they've been with plus everyone all those people have been with. I thought this picture was a good representation of that. It's a reminder to me that no matter how much you trust, or think you can trust someone, it doesn't pay to not be safe and you should always use protection and frequently get tested. It amazes me how much people have become lax in practicing safe sex, especially younger people who weren't around through the huge HIV scare. I know it's hard with lack of funding but I wish the media, or schools or whoever would throw it back up in our faces so people become more aware again that it's still out there and it's something we should all be afraid of and protected against. - MM, Student Pharmacy Technician

I would call this piece Antidepressants, Antipsychotic, Stimulants and Hallucinogens. Each piece has a specific drug that explains what is going on. I will start at the top and go from left to right like a book. The first block has two people, one of which looks like they are eating and the other appears nervous. I will call this one Tetrahydrocannabinol because they look paranoid and like their appetites have increased. The second block I will call Bipolar disorder: Fluoxetine + a mood stabilizer. The third block is called Risperidone, because the bipolar has changed into the person going into a “mania” state grabbing the other person's arm. The next block is called

Imipramine to avoid the bedwetting since they look like the pictures from the text showing what urinary retention looks like. The next 3 blocks look like the people are having a good time and are busy. I would call them the caffeine days. Days when you drink a lot of coffee and go, go, go! The next 7 blocks I will call LSD from *Claviceps Purpurea*. They look like the side effects this drug causes. Some look like they are happy having hallucinating and delusional moments. Then all of a sudden they have "bad trips" where they are paranoid, fighting, scared and having flash backs. -MG, Student Pharmacy Technician

### Superplexus Vortex I by Michael McGinnis



<http://www.santarosa.edu/art-gallery/slideshows/faculty-2012/mcginnis-01.php>

Among those different arts in library, I was stuck in one art which is really unique in style. It just doesn't look like an art but it is a 3D object. Structurally it is the shape of a globe but the ball inside it looks like our cerebrum and as indicated in our book that cerebrum is the largest and uppermost portion of the brain. It is the site for conscious thought memory, reasoning, and abstract mental functions. So whenever I see this art, it just reminds me of my brain and wonder my brain might be somehow would look like this. Overall, I really enjoyed viewing these arts and also excited that I am getting extra credit which is really a good opportunity for students like me. I am thinking of visiting there one more time. Thank you Diana!!! -JM, Student Pharmacy Technician

This piece of art caught my attention as soon as I entered the art show room. My interpretation of this piece and pharmacology is the brain. To me it looks like the inside of a brain. It reminds me of all the electron impulses that our brain transmits every second of our lives and how medication is capable of changing or altering those impulses to deliver a therapeutic effect. Antidepressants are a great example that targets the brain messengers to relieve the symptoms of depression. Now pretend that some of those wooden pieces were missing or damaged. That means that a part of the brain has been damaged. Once this occurs a patient needs medication to mimic the missing pieces. Anti-psychotics combined with therapy are another great example of how advanced medication is now a days to help the brain or trick the brain, therefore giving the patient a feeling into reality. - RM, Student Pharmacy Technician

The piece I chose to connect to my world as a pharmacy technician in the faculty art show is the piece entitled "Superplexus Vortex I," 2009 by Michael McGinnis. This piece stimulated my mind with many thoughts from this program. The first correlation I made is was that the shape reminded me greatly of the "Skull" project. The way information and decision making is processed through the brain so fast reminded me of this piece. The spherical shape with crossed connecting bridge like pieces reminded me of the way the brain processes information and makes the "fight or flight" decision. I really enjoyed this piece a lot and would love to have one myself. - FD, Student Pharmacy Technician

I can see multiple things in the human body. The one thing that came to my mind immediately is it that this could be a red blood cell. The plastic shell would be the cell body that contains the rest of the blood cell. From the outer part of the cell would be intermediate filaments. As you go deeper you can imagine that at the center would be the nucleus that contains the DNA of the red blood cell. Just off of the Nucleus would be the Rough Endoplasmic Reticulum and then comes the Smooth Endoplasmic Reticulum. The Ball bearing that was in the art piece would be the Peroxisome or the Secretory Vesical or the Lysosome that would be contained in the cell. Of course you have add in the rest of the cell but that is what came to mind when I looked at this piece of art. - CR, Student Pharmacy Technician

How could I resist writing about this piece! I loved it the moment I saw it and did not even realize that it was an interactive piece until I saw it on another day when other viewers were playing with it, a marble inside moves along the inside tracks as the piece is moved in an unrestricted manner. It reminded me of a cell with organelles, or parts such as mitochondria, Golgi bodies, a nucleus and lysosomes. These parts are connected by the endoplasmic reticulum, illustrated by this piece's complex system of tracks. The interior of the cell is called the cytoplasm and it is contained in the cell membrane. A cell floats within a fluid environment, moving freely, as this piece does. - JH, Student Pharmacy Technician

This piece of art stood out to me, because it was of a different type of material. It wasn't paint on canvas, but wood inside a clear ball. Everything about this piece stood out. The way the wood curved around itself and the subtle pieces that stood out, such as the stair case. It was different. Just like every single person in this world is different. We are each raised different, which affects us all differently. Some people have traumatic events in their lives that set off things in the brain. Changing the way the brain works, leads me to what I see when I looked at this piece of art, which was a brain fighting to find normal. This piece to me was a brain that had been affected by a life experience that set it off, causing it pain, directly causing the person mood to change. That's where the ladder represents the person taking each day a step at a time and trying to find what normal really is. When their life was never really normal to begin with, but they are searching for what normal is to them. - CI, Student Pharmacy Technician

I attended the Art Faculty Show today and I viewed the artwork in terms of how it could relate to pharmacology. One of the pieces that struck me the most was "Superplexus Vortex I" by Michael McGinnis. The best way I can describe what the piece looked like was a very intricate maze made of wood with a clear spherical-shaped ball around it. The goal was to get this little tiny ball through the giant maze, a task I could probably never accomplish!

In terms of pharmacology, this piece reminded me of the absorption and metabolism every drug must go through in our bodies. All of the veins, arteries, and parts of the digestive tract a drug must go through in order to exert its effect within the body is similar to the maze in this piece of artwork. If this piece of artwork were to represent a new drug, I would call it Completex, because this revolutionary drug would have the power to heal whatever is going wrong in the body! Since the artwork encompasses what all drugs must go through, it made me think out of reality into a world where there was such a thing as a cure for all the diseases and ailments out there. I know it is not really possible, but the opportunity to find the ideal drug, I believe, is still out there. - KA, Student Pharmacy Technician



## Perplexus Visualizations Series Observatory I by Michael McGinnis



<http://www.santarosa.edu/art-gallery/slideshows/faculty-2012/mcginnis-04.php>

This photo that I found would represent what would take place to any orally taken medication. The ball bearing that is on the table represents the drug which is about to be taken. At the top of the photo is the mouth where the pill or drug will be administered. From that point the drug or pill would travel down through the upper GI tract and be absorbed in the small intestine. It will travel through the circulatory system to the liver. That would be at the right back portion of the photo. After it is metabolized by the liver it will complete its cycle and be filtered out of the body just below the "stomach part" of the GI tract. You could make it the kidneys or the byproducts that would be taken out with the excretion urine or the feces. -CR, Student Pharmacy Technician

This series of visual designs remind me of neuroleptic drugs. Although these pictures belong to one series, they present different structures and create different effects. For example, one of the pictures has primarily red straight lines, making it boxy and linear. Another picture has circles with lines and two colors, thus making it more complex. They are all related, but exert a different effect. This relates to neuroleptic drugs because they belong to the same drug category, but all neuroleptic do not have the same structure or effect. Some neuroleptic drugs act on muscarinic receptors, dopamine receptors or serotonin receptors, in addition to treating psychosis. Although they related to their anti-psychotic treatment, they exert other effects as well based on affinity.- MC, Student Pharmacy Technician

## Perplexus Visualizations I by Michael McGinnis



<http://www.santarosa.edu/art-gallery/slideshows/faculty-2012/mcginnis-03.php>

I saw in this piece chemistry, since pharmacology has a lot to do with chemistry. This image reminds me of the ionic compound sodium chloride, NaCl, also known as salt. It is most responsible for the extra-cellular fluid of many multicellular organisms. The metal sphere in the bottom right hand corner is what appears to be like an electron orbiting around the compound. We can also see it as the reddish and blue figure as the compound that hasn't

dissociated in the water yet, and the metal sphere could either be the  $\text{Na}^+$  ion or the  $\text{Cl}^-$  ion that has dissociated. When these ions have dissociated in water in the body, they are normal constituents of the body fluids as mentioned before and are essential for maintaining electrolyte balance. The distribution and excretion of these ions are largely under the control of the kidney which maintains a balance between intake and output. Since water accounts for approximately 70% of total body weight and is an essential constituent of all body tissues, maintaining a balance is essential. The distribution of the water depends primarily on the concentration of electrolytes in the body and sodium plays a major role in maintaining this physiologic equilibrium. In pharmacology the dosage form of sodium chloride is usually injection or a solution.- LR, Student Pharmacy Technician

### Michael McGinnis's "Personal Perplexus."



The sophisticated and complex workings of the brain is simplified in Michael McGinnis's "Personal Perplexus." The game on its surface is meant to puzzle and challenge the mind. The object itself can be viewed in relation to the brain as well. The tracks form the physical connections to all other parts of the sphere in a three-dimensional nature. In order to reach the goal (or connection) complex steps must be navigated and manipulated. Very similar to the intricate nature of the information processed within the nervous system.- KG, Student Pharmacy Technician

### Michael McGinnis "Perplexus Visualization Series: Over the Straight Edge"



<http://www.santarosa.edu/art-gallery/slideshows/faculty-2012/mcginnis-06.php>

I see little squares connecting or separating each other. The first thing that came to my mind was HIV cells attacking the white blood cells in a person. The HIV cells make copies of itself by infecting the living organism and the square separating brought this picture to my mind - NM, Student Pharmacy Technician

### Gina Teicocci “Shadabad”



<http://www.santarosa.edu/art-gallery/slideshows/faculty-2012/telcocci-02.php>

A single drop of blood, of a liquid, etc., pharmacology is the study of these. Drugs equilibrate in the blood, as a steady state and we describe the dose-response curve as well as the volume of distribution, bioavailability, elimination, absorption and half-life. These all depend on how a drug behaves in a liquid medium, the plasma portion of blood, and also inside of cells, the enzyme systems (MAO), between the cells, neurotransmitters, etc. A single drop of a liquid, even a drop of blood, might seem like a trivial thing, but it can be a highly complex system. This sculpture impressed me by its simplicity of form and complexity of design. Thanks for letting us do this, it was fun and interesting. - JH, Student Pharmacy Technician

### Kevin Fletcher “Bob, Carol, Ted, Alice Springs: Four Melbourne Residents of an Activist Milieu”

<http://www.davidsongalleries.com/artists/fletcher/fletcher.php>

This portrait, to me, is so literal. Do you see it? Dissociative Identity Disorder (aka Multiple Personality Disorder). Here we have four different people, separate, yet the same. The eyes are of the same person. It is hard to know who the person really is. Generally, one of the personalities takes on a dominant role with this disorder, yet here there isn't one. It is possible that this is near the manifestation of the “other” personalities, or it is near the end, and the numbers have diminished to only four and they are merging so not to have a dominant personality. The inability to remember things is one of the symptoms. The person forgets personal information. The pictures of the different homes and cars can represent personal details that get lost to the patient. Each person has an equal amount of space in the portrait, which adds to the confusing question of who the person really is. There is also an inner struggle and confusion of whom this person is in regards to gender. This is illustrated by the presence of two males and two females. This could represent so many things; possibly some sexual abuse as a child, confusion of sexual orientation, the inability to identify one's sexuality. This portrait feels so uncomfortable, too much confusion, the same person but with four different personalities-disturbing. - MJT, Student Pharmacy Technician

### Deborah Kirklin “Eddies in the Columbia”



<http://www.santarosa.edu/art-gallery/slideshows/faculty-2012/kirklin-02.php>

This piece resembles the condition of a person, suffering from depression, after taking a dose of antidepressant drug. It elevates the mood, which is similar to the calm water and clear surrounding on the painting. Antidepressant drugs increase the activity of neurotransmitters in the brain which balances the function of the brain. - MJT, Student Pharmacy Technician

### M. Loffredo "Italian Typewriter"



<http://www.santarosa.edu/art-gallery/slideshows/faculty-2012/loffredo-01.php>

I will first have to admit, I thought, "ok", when I walked into the art gallery and saw many different art forms at work. What will catch my eye? As I entered into the larger of the two rooms up against the wall I saw a large guerilla like machine guns with brass bullet shells

This seemed dark and full of anger and anxiety. I was thinking of nerves and connections and myelin sheaths around the Axon of the efferent neuron that is shown in our text book on page 44. I came to a realization that some people are not happy and content like the world around them would like them to be, or they themselves would like to be. The gun brought to mind the dark and depressing underlying type of depression or anxiety in life. There might be the possibility that his or her chemical transmitters of serotonin and dopamine or norepinephrine may be out of balance. So considering that these neurotransmitters are not functioning at normal levels that my thoughts went to SSRI's or better known as selective serotonin reuptake inhibitors such as Prozac, Zoloft, and Paxil. The SSRI's are known to balance out the serotonin and dopamine and norepinephrine in peoples systems as to help them live a more balanced life. SSRI's bring balance to our forces that work against each other, to work better together and bring peace and happiness and compatibility to cope more freely with daily life, instead of worry and sorrow and anxiety.

When our mental state is in a calm environment in our heads we don't worry and dwell as much on the outside forces of life that try to test us in ways that cause us to dwell only on negatives but on the positives also. Helping us realize that life is good and everything that works together will have a balance and we can find our happy place. - BF, Student Pharmacy Technician

### M. Loffredo "Dead Eye Tony"



The first art exhibit that caught my eye was the piece titled "Dead Eye Tony" by M. Loffredo. I, myself being a retired military veteran know what it takes for a soldier and his weapon to operate properly and effectively. It takes more than pulling the trigger on a weapon for it to be effective. The soldier and weapon must become one and operate as one. I relate this too how the human body's circulatory system runs. The right side of the heart pumps blood into the lungs to be oxygenated and the left side pumps the oxygenated blood to the systemic circulation. Blood is then transported through our bodies by vessels in the body, arteries, capillaries, and veins. The blood transported in our body serves a crucial role to the many elements needed for life. It carries nutrients away from the GI tract to the organs responsible for converting these nutrients into proteins and tissues, and carry oxygen to every tissue in the body. One cannot operate or perform effectively without the other, just like a weapon could not operate proficiently without a highly trained soldier.-GC, Student Pharmacy Technician

### Natalie Robb-Wilder “WoodSmoke”



<http://www.santarosa.edu/art-gallery/slideshows/faculty-2012/robb-wilder-01.php>

From a distance brought my eyes to intimate details of the texture and unexpected colors. I looked at the mixing color of the picture. I saw a bottle of the picture there was a light of the smoke transformed my attention. By comparing that picture to what I have pictured in my mind it related to a lung cancer by smoking. When a person smoking a lot that it was looked like a WoodSmoke by Natalie Robb-Wilder. Which is very interesting to me a reflections of a smoking routine. The medication that treating smoking cessation is reminded me of Nicotine, transdermal patch, gum, nasal spray and inhaler. -TH, Student Pharmacy Technician

### Tom Ferentz “Night and the City”



<http://www.santarosa.edu/art-gallery/slideshows/faculty-2012/ferentz-01.php>

I choose a picture of an old man. He has very black skin. The color of the skin that told me that he was working very hard for his life. He was looking very sad with a tear in his eyes. The sadness he looked made me think of depression problem that he has to do with his life. With a poor looking it can bring him with depression problem. When I looked at him I can tell that he has poor nutrients in his body. When a person did eat good food or haven't had good nutrients that will show up on your face and body. I believe eating good foods will bring people to a healthy body and a long life for living. - TH, Student Pharmacy Technician

————— end —————



## EMR~ Master Classroom

**“It always seems impossible until its' done”. ~Nelson Mandela**

In the communication of information, leaders have an obligation to be differentiators.

Leaders appreciate contextual change. They comprehend the “Why” embracing the vision. A truly amazing, powerful development is the creation and bringing to life an idea. Leaders guide the collective insights so as to engage, strengthen and trust the process is on course.

In the United States of America full utilization of Electronic Medical Records (EMR) is meager. Success can be attributed to a commitment to long-term relationships. Assessment, planning, implementation, revisions of clinical processes and information systems are significant change initiatives.

Fear influences the dynamics.

How then to proceed?

First and foremost, the application of an effective classroom will enhance success. What are the attributes of such classrooms? They can be portrayed as relationships with expectations, knowledge, support, assessment, feedback, and engagement.

### Expectations and Knowledge

Performance is driven, in part, by expectations. High expectations are a condition for excellence. Success is directly influenced by clarity, consistency, communication and concern. Expectations are connections conveyed through syllabuses, interactive learning, assignments, metrics, course and site management and conversations.

### Support

At no time is support most imperative than during the critical first year. A key feature is: The

maintenance be aligned or contextualized to the inherent demands. Basic skills enable an easier translation to success. Contextualization creates explicit connections between the training and instruction.

### Assessment and Feedback

Achievement connects behaviors. Performance assessments and furnishing frequent feedback facilitates success. This enables individuals to adjust their behaviors. Assessments are effective when utilized early in the process to trigger academic learning, collaborative support, and performance encouragement and reinforcement.

Dedication to this progression is judicious during the first year when people are endeavoring to adjust their behaviors to the new necessities.

### Engagement

Simply put, the more people are academically and socially engaged the more likely they are to succeed and prosper. Establishing a pattern of behaviors early generates greater involvement and enhances effort.

### Reshaping Efforts

Shaping behaviors improves patterns. The capacity to reshape the nature of performances is a conditioning procedure which deserves special attention. Evidence supports the effectiveness and degree of accomplishments.

### Contextualized Support

Contextualized support can be achieved in a variety of ways. The most common is the deployment of groups.

Leaders of the groups work closely with the mentor to ensure that the work of the group is closely aligned to the demands. The result is: Such groups are linked to higher than average success. This method challenges conventional assumptions.

Learning communities establish connections. They provide structure, reinforcement and maintenance. Integration and collaboration of technical information and training is in context. The outcomes are: The people acquire, absorb, understand, and discover self-proficiency.

### Automating Assessment, Feedback, and Early Warning

There are a variety of assessment techniques that can be applied to assess learning and trigger early intervention. They include:

- \* Three-Minute Teach
- \* Muddiest Point
- \* Chain Notes
- \* Memory Matrix
- \* Directed Paraphrasing
- \* One-Sentence Summary
- \* Application Cards
- \* Process Application
- \* Knowledge Probe
- \* Focused Listening
- \* Empty Outlines
- \* Analogies
- \* Problem Tasks
- \* Human Tableau

Technologies allow for easy capture and analysis. A web-based platform develops predictive modeling and data mining. This has proven most effective in their first two years.

### Stimulating Engagement

By employing pedagogies of engagement people experience learning. Cooperative learning, problem or project-based training, collaborative groups, active and interactive guidance all are responsible for the knowledge. Requiring people to work together, in this way, they share the experience and performance enhancement.

By asking individuals to construct knowledge together, both socially and intellectually, promote cognitive and social development. In addition, this fosters an appreciation for how one's own knowing is enhanced when other voices are part of that

learning experience.

### Concluding Thoughts

Leadership is the combination of positive influence and effective action. It is an issue of consistency and genuineness.

The human challenge is to learn to breathe these words throughout life. Senior executives must step away from the hard skills of leadership (results) and step into the soft skills of leadership (relationships).

This has a simple yet profound impact.

When you really know your people, you will find opportunities that provide the foundation for engagement and retention.

It all starts by building a culture model.

“It always seems impossible until its' done”. -Nelson Mandela

- Diana Rangaves, PharmD, Rph

## FEATURED Palliative Care

**Synopsis:** In the creation of palliative care programs, hospitals can conserve healthcare dollars. Palliative care emphasizes the quality of life with significant reductions in per diem and total costs. This can produce considerable savings to the health system by “cost avoidance.”

The recommendations in this publication do not indicate an exclusive course of treatment or serve as a standard of medical care. Variations, taking into account individual circumstances, may be appropriate. This content is for informational purposes only. It is not intended to constitute financial or legal advice. A financial advisor or attorney should be consulted if financial or legal advice is desired.

### Objectives:

1. Describe the purpose of palliative care programs.
2. Identify the source of cost reductions in a palliative care program.
3. Recognize the key goals of palliative care.
4. Distinguish specific parts of the patient palliative care process.
5. Describe common reasons for palliative care.

### Glossary Of Terms

#### Advanced directives

Advance health care directive, also known as living will, personal directive, advance directive, or advance decision, are instructions given by individuals specifying what actions should be taken for their health in the event that they are no longer able to make decisions due to illness or incapacity, and appoints a person to make such decisions on their behalf.

#### Bereavement Counseling

Bereavement counseling is assistance and support to people with emotional and psychological stress after the death of a loved one. Bereavement counseling includes a broad range of transition services, including outreach, counseling, and referral services to family members.

#### Chronic Care

Long-term care of individuals with long-standing, persistent diseases or conditions whose care includes care to a specific problem, as well as other measures to encourage self-care, promote health, and prevent loss of function.

#### Consultation

Service provided by a healthcare provider whose opinion or advice regarding evaluation and/or management of a specific problem.

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### DRG

Diagnosis related group

### FTE

Full time equivalents

Health Insurance Portability and Accountability Act (HIPAA). HIPAA is a federal law enacted in 1996. It was designated to improve availability and portability of health coverage and the efficiency of the health care system by standardizing the electronic exchange of health information and protecting the security and privacy of member-identifiable health information.

### Hospice/Palliative Care

Hospice/Palliative Care programs offer pain management, symptom control, and other medical services to terminally ill veterans or veterans in the late stages of the chronic disease process.

### Inpatient Care

Services received during a patient's hospital stay.

### LOS

Length of stay

### Palliative Care

Care provided primarily to relieve symptoms of a disease or condition rather than for curative purposes.

Aspects of these definitions were inspired by definitions published by United States Department of Veteran Affairs

### INTRODUCTION

A palliative care program offers assessment and management of patient needs throughout the inpatient environment. The team behaves interactively on the principle that palliative care is a

service. Common reasons for palliative care are:

- Pain and symptom control
- Discharge planning and continuity of care
- End-of-life decision making
- Psychosocial issues involving patients and families
- Ethical issues

Palliative care is an essential component; that is necessary to strengthen our health care system and enhance coordination of care, quality, and cost.

### THE SHARED CIRCLE

The ancient and universal symbol of the “circle of life” is one we all share. Each of us lives our lives as a piece of the whole. Everything in existence participates in this great cycle. The four stages are Birth, Development, Creation and Passing.

The “Circle of Life” refers to the fact that death is not really the end but the seed for something new. The First Law of Thermodynamics, “Energy can be neither created nor destroyed, only changed,” is a fundamental truth. The field of thermodynamics is the foundational basis for the study of Energy flow in natural systems.

This concept applies to other systems and processes. “When you think of the modern American hospital, it is designed to take care of the average person,” Dr. Morrison explained. “Most hospitals’ systems are aligned to rapidly bring such people in, diagnose them, treat them and transition them to an appropriate care setting, usually home”.

In contrast, palliative care programs are specialized for taking care of the very complex 5% of the population that drive 40% of health care costs. “They make a highly inefficient system efficient for most complex patients”.

Why are palliative care programs so cost-effective? Essentially standard hospital care is ineffective at managing complex patients with life-threatening illnesses. By necessity these patients are the chosen for a palliative care program. Palliative care has matured and been nurtured by 53% of American hospitals with 50 or more beds, compared with almost none 10 years ago. A 2008 report from the Center to Advance Palliative Care gave the nation overall a grade of C in access to hospital-based palliative care. More than 20% of the 50 states received “unacceptable” grades of D or F, and only four states received an A. Flourishing palliative care programs are aligned with the corporate mission of compassion and absorbed into the foundation of the corporate culture.

### SUSTAINABLE DESIGN

Core elements differentiate palliative care programs. First, palliative care programs aggressively treat pain, infection, and other symptoms. “When people are comfortable, and in some control, they can make decisions. They tend to stay in the hospital for a shorter period of time.”

Second, palliative care programs help patients and families make decisions and develop clear treatment plans in the challenging setting of complex illness. “Treatments in palliative care aren’t one size fits all, people are individuals.”

Third, palliative care teams know their patients and community very well. “This means they know the needs of people with serious and life-threatening illnesses and can marshal resources for them, allowing these patients to leave the hospital with safer care plans,”

Palliative care “shifts” the course of care off the usual hospital pathway and, in doing so, significantly reduces costs. Direct hospital costs could be reduced by almost \$1,700 per admission (\$174 per day) for live discharges and by almost \$5,000 per admission (\$374 per day) for patients who died. The average 400-bed hospital providing palliative care to 500 patients during the year could see an annual net savings of \$1.3 million. After the process began, decreases in costs consistently occurred.

The savings came from reductions in laboratory work, intensive care costs and pharmaceuticals. Palliative care is about providing support, options and choices, not rationing care. It is about giving and receiving from all perspectives and contexts. Witnessing the process, allowing it to unfold, and providing as much comfort as possible in order for the patient to live their final days as they choose. Therein lays the gift.

### INSPIRED GOALS

“And in the end, it’s not the years in your life that count. It is the Life in your years.”  
Abraham Lincoln

Palliative care management is in alignment with the patient’s wishes and desires. These therapies complement the goals. Palliative care teams interview patients and their families early in treatment to identify what they want from therapy. They also assist with day-to-day care of patients. Meticulous criteria to assessment and treatment of patients is a competency standard. “Physical symptoms, goals of care and transition planning must be consistently addressed in the same manner.”  
The principles of palliative care are ones that place the patient at



the focal point. They provide information and personal assistance in support of a patient's right of choice. Additionally they emphasize the patient and provider relationship while enabling maximum effect of insurance benefits with less costly and more satisfying results.

Palliative care teams' ongoing involvement in patient care is critical for success. Teams contribute to the clarification of goals of care with the patient and family. They guide families to select appropriate medical treatments and support decisions to withhold or withdraw death prolonging therapies. Most patients are discharged alive. The emphasis is not end-of-life care.

## REGENERATIVE STRATEGIES

A major cost for the palliative care program will be staffing. Determine how many FTEs are needed in each staff category whether comprised of part-time, full-time or both based upon projected daily census. A downloadable, sample consult service budget can be used to create a program budget from the Center to Advance Palliative Care website. The references below are taken from this spreadsheet. The Department Administrator or Human Resources can provide average salary rates to use in:

Budgeting (A), as well as

Benefits percentages (B).

Salary plus benefits can now be determined ( $A + C = D$ ).

The staff expense (D) is then pro-rated by the actual number of FTEs (F) to determine the total cost of each staff category. That is, if salary plus benefits equal \$216,000, then the staff expense of 0.3 FTE is equal to  $\$216,000 \times 0.3$  or \$64,800 (F). Summing the total cost for each staff category provides the total staff and overhead costs.

In most cases, a cost efficient inpatient unit needs to be of a certain size due to the need to staff for continuous direct clinical care (3 shifts, 24/7). Achieving economic efficiencies with a small unit will be difficult unless staff can be shared with an adjacent unit or the unit's beds can be used by others (inpatient hospice or float overflow from other services).

## INTEGRATIVE LEADERSHIP MANAGEMENT--- COLLABORATIVE PARTNERSHIP

A collaborative undertaking concentrated on care management brought together the Hertzberg Palliative Care Institute at Mount Sinai School of Medicine in New York City and Franklin Health, Inc. (FHI) of Saddle River, New Jersey and Blue Cross/Blue Shield of South Carolina, which supplied patients with complex illnesses who could benefit from palliative care and care management.

FHI, one of the country's leading disease management firms, has established the gold standard for effective coordination and management of difficult, costly, high-utilization cases. Managed care organizations across the country contract with FHI to identify such patients from utilization data, provide on-site care coordination and work with health plan officials and primary care physicians to optimize coordination of care and prevent medical complications that lead to costly hospitalizations.

"Most hospitalizations occur in a crisis, when the whole care system falls apart and the patient ends up in the emergency room the place of last resort and a highly inefficient setting to manage this patient population. The hospital avoidance occurs not because somebody says, 'You can't go because we won't pay for it,' but because the need is averted which is also good for the patient. When patients feel safe at home because they know they have a care coordinator who knows them and can help them at a moment's notice, they are much less likely to take their problems to the emergency room. It's the ones who don't feel safe at home, who feel abandoned, and who end up in the hospital." Dr. Diane E. Meier, Mount Sinai School Of Medicine

The company's preliminary data also shed light on other measurable results from the palliative care initiative, including:

- Significant reduction in the perceived burden of symptoms by seriously ill patients and improved symptom management scores eight weeks following admission in a number of key areas;
- Increase in the number of advanced directives completed and used in clinical decision making;
- Very high acceptance and patient satisfaction rates, as well as high acceptability rates from clinicians;
- Increase in the number of identified domains of care that the nurse care manager identified as problems to be addressed; and
- Increase in the number of new prescriptions ordered to treat specific symptoms (from 28 percent per patient in the control group to 64 percent in the palliative care intervention group).

"Patients in the intervention group received more prescription drugs aimed at symptomatic distress, including pain medications, which means the care manager has successfully contacted busy primary care doctors in their offices and, when indicated, gotten them to prescribe controlled substances," Meier explains. "That's incredible. The doctor still has to sign the order for the prescription, but I thought that would prove to be one of the biggest barriers to the project."

Patients with advanced illness have a long length of stay and high cost of admission. The outcomes of palliative care are multifold.



**Palliative Care results in:**

- Reduction in the Length of Stay
- Reduction in the Total Costs/Admission
- Opportunity for New Admissions
- Better Quality of Care
- Highly Satisfied Families

**Length of Stay Reduction Mount Sinai Hospital Data - 2001:**

Medicare Data: Palliative Care Patients spent 360 fewer days in Mt. Sinai as compared to Diagnosis Related Group Matched patients not followed by Palliative care

**Reductions in Total Costs for Medicare Beneficiaries in 2001:**

Cost savings from palliative care = \$757,555 per year for patients with LOS > 14 days  
 Cost savings for Palliative Care = \$455,936 per year for patients with LOS > 28 days  
 Cost per day = total per DRG / Avg LOS per DRG for patients who passed  
 Costs reduced by palliative care = Cost per day x number of days saved by Palliative Care

**Percent of Palliative Care Families Satisfied or Very Satisfied Following Their Loved Ones Death with:**

- Control of Pain 95%
- Control of Non-Pain Symptoms 92%
- Support of Patient's Quality of Life 89%
- Support of Family Stress and Anxiety 84%
- Manner of healthcare providers 88%
- Overall Care by the Palliative Care Program 95%

**CONNECTIONS FOR THE PHARMACIST AND PHARMACY TECHNICIAN**

A built in program support system is available within the Pharmacy Department. All participants can explore service and life-altering experiences in Palliative Care. The American Journal of Health-System Pharmacy Statement provides a framework upon which a responsibility structure can be built. Below are the seven points the Statement addresses:

1. Assessing the appropriateness of medication orders and ensuring the timely provision of effective medications for symptom control. Pharmacists maintain patient medication profiles and monitor all prescription and nonprescription medication use for safety and effectiveness. Pharmacists provide patients with essential medications within a time frame that ensures continuous symptom control (especially pain relief) and avoids the need for emergency medical services.

2. Counseling and educating the hospice team about medication therapy. Pharmacists attend hospice team meetings to advise other team members about medication therapy, including dosage forms, routes of administration, costs, and the availability of various drug products. This is done through regularly scheduled educational sessions. Pharmacists develop and maintain a library of contemporary references about medications, dietary supplements, and alternative and complementary therapies. Pharmacists advise members of the hospice team about the potential for toxicity and interactions with dietary supplements and alternative and complementary therapies.

3. Ensuring that patients and caregivers understand and follow the directions provided with medications. Pharmacists ensure that all medication labeling is complete and understandable by patients and their caregivers. Hospice pharmacists communicate with patients, either through the team or in person, about the importance of adhering to the prescribed drug regimen. Pharmacists explain the differences among addiction, dependence, and tolerance and dispel patient and caregiver misconceptions about addiction to opiate agonists. Pharmacists ensure the availability of devices and equipment to permit accurate measurement of liquid dosage forms by patients and their caregivers. Pharmacists counsel patients about the role and potential toxicity of alternative and complementary therapies. When needed, hospice pharmacists visit patients' homes to communicate directly with patients and their caregivers and to make necessary assessments.

4. Providing efficient mechanisms for extemporaneous compounding of non-standard dosage forms. Hospice pharmacists communicate with pharmaceutical manufacturers to determine the availability of non-standard dosage forms. Medication compounding needs in hospice care include the preparation of dosage forms to ease administration (e.g., concentrated sublingual solutions, topical medications), flavoring medications to promote compliance, eliminating or adjusting ingredients that patients cannot tolerate, and preparing or changing drug concentrations. Whenever possible, pharmacists compound formulations for which stability and bioavailability data are available.

5. Addressing financial concerns. Hospice benefits usually cover medications. However, patients may lack insurance coverage or benefits may not cover medications that are not considered strictly palliative. Pharmacists communicate with pharmaceutical manufacturers to obtain medications through patient assistance programs.

6. Ensuring safe and legal disposal of all medications after death. Medications dispensed to patients are "owned" by patients and, in most states, cannot be used for other patients. Medications remaining in patients' homes fall under a variety of hazard categories. Pharmacists are able to assist families with the removal of the medications from the home in compliance with

federal and state drug control and environmental protection laws and regulations.

7. Establishing and maintaining effective communication with regulatory and licensing agencies. Because hospice patients often require large quantities of controlled substances, open communication with both state and federal controlled-substance agencies is important. Pharmacists ensure compliance with laws and regulations pertaining to medications.

Pharmacy technicians are indispensable. They provide pharmacists with logistical support, as well as perform greater tasks within their scope of practice to keep operations running smoothly and allow pharmacists more time to work directly with patients.

Pharmacy technicians enhance the pharmacy ensemble. This results in higher standards, efficiencies and quality. Successful programs have effectively utilized the skill sets of Pharmacy technicians to better connect with the patients and communities they serve.

## CONCLUSION

The author believes in the exceptional value of palliative care teams. The impact will increase in significance as the proportion of older, complex and chronically ill patients' increases. This will be an influencing force to improve the quality of care by utilizing health care resources in a sustainable and sensible way.

## ENDNOTES

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