

DPM NEWS

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Hands On Defibrillation

You may have recently heard about continuing CPR *while* delivering shocks during cardiac arrest. See Dr. Cushman's article on *page 2* for more on this practice.

New DPM Faculty Member

On *Page 10*, meet Dr. Maia Dorsett, the newest faculty member at the Division of Prehospital Medicine.

The Power of Preparation

Dr. Chris Galton discusses how to maximize your effectiveness during a cardiac arrest using an example from his extensive background as a paramedic on *page 7*.

Is Bigger Always Better?

Our region continues to be a leader within the state for advancing prehospital care through evidence-based medicine, which aligns with the DPM mission statement to continuously advance and deliver prehospital medicine of the highest order.



Recently, Dr. Cushman released MLREMS Advisory 17-06 which advocates using a pediatric BVM when ventilating adult patients because it provides a more appropriate tidal volume and minimizes the harmful consequences of over ventilation. A study published by Siegler et al in *Prehospital Emergency Care* demonstrates the advantages of this practice. You can take a look at a summary of that study here: <http://www.tandfonline.com/doi/full/10.1080/10903127.2016.1227003>.

Initiatives such as this and the one discussed on the next page help our providers provide the best care to our patients which should be the overarching goal for every EMS provider.

As always, if you have any feedback or suggestions about this publication, please contact me at e.rathfelder@gmail.com.

-Eric Rathfelder

Upcoming Events

Melinda Johnston

For more information about any event listed below, please visit the training calendar at MLREMS.org

September

27 - SCT Conference

27/27 - ICS (I-400)

30 - CIU

30 - First responder training for animals

October

6/7 - Assisting Individuals in Crisis

10 - MLREMS preceptor class

11/12/13 - ICS (I-300)

12/13 - Eastern Great Lakes Burn Conference

14 - ALS Core #1

16 - MLREMS preceptor class

21 - ALS Core #2

25 - First responder training for animals

28 - ALS Core #3

November

3/4/5 - CLI original

3 - Advanced Burn Life Support

4 - ALS Core #4

11 - ALS Core #5

14 - EMS Stroke Conference

18 - ALS Core #6

18 - First responder training for animals

Hands On Defibrillation

Jeremy T Cushman MD, EMT-P, FACEP



There is little question that high quality, continuous compressions in cardiac arrest improve neurologic outcomes. My choice of outcome here is important: compressions are really to maintain some oxygenated blood flow to the brain in order to keep it alive long enough for you to get the heart started again. All too often we get ROSC but the patient has anoxic brain injury which can be a result of extended down time or ineffective compressions.

Thus our goal in performing compressions is to minimize interruptions, for every time we stop compressions it takes a significantly longer time to return to the flow state you had just prior to stopping them. Thus, many of you have heard my expectation that nothing should interrupt compressions – not IV access, not an intubation attempt, not ventilation. Yes, I know the AHA is still teaching 15:2 and 30:2, but my read of the evidence is that those systems that have moved to continuous compressions have seen increased rates of ROSC and neurologically intact survival. Heck, we have known for nearly a decade that CPR feedback devices improve CPR quality, yet the AHA is just now incorporating that into CPR education in 2018.

You may have recently heard that at one of my agencies I have authorized the practice of hands-on defibrillation. Many have asked about the literature that makes me think this is OK after decades of us being told to “stand clear”? Well, here it goes...

The most important article, in my mind, was that by Edelson and colleagues (Circulation, 2010), which found a decrease in perishock pause by charging before rhythm analysis. To me, this is the single most important thing that we can be doing, particularly when using a manual defibrillator. Unfortunately, most AEDs don't allow this because of software and rhythm analysis, so its more of an ALS function. In short, what I want everyone to become comfortable with is instead of analyze-charge-shock it should be charge-analyze-shock. Thus, when you are about

to check a rhythm, charge the monitor while CPR is ongoing, then stop CPR to do your rhythm check. If it is shockable, push the button; if the shock is not indicated, restart CPR and the capacitor dumps it and there are no issues.

In terms of providing compressions while defibrillating, I believe this practice is safe. I understand some providers might feel uncomfortable with this practice, which is why I will always expect and require an affirmative response from all parties prior to defibrillating. I have performed hands-on defibrillation myself, but if folks are uncomfortable even after my read of the evidence, I understand. The first well done study on this was by Lloyd and colleagues (Circulation, 2008) which found "leakage" (meaning the amount of current going to the provider) in an ideal setting to be well below the allowable minimums. Keep in mind, this study looked at microamps of current with an allowable threshold of 3,500 microamps. The measured leakage was an order of magnitude less than that. As a point of reference, when we cardiac pace patients transdermally, we deliver milliamps of current (usually about 60-80 mA) in order to capture a heart rhythm. In this study, the researchers measured a mean amperage (current) for leakage of 285 microamps or 0.28 mA. Therefore, in general more than 200 times the average leaked amperage would be required to cause electrical capture of a heart rhythm.

Neumann and colleagues (Journal of AHA, 2012) followed Lloyd's work and found (in a swine model) that leaked amperage was imperceptible and the compressor wearing a cardiac monitor had no abnormality. More recently, Wampler and colleagues (Resuscitation, 2016) did a study looking at perception of shocks by the person providing compressions using multiple models, including nitrile gloves and a CPR feedback device (the "puck" which is proven to improve compression quality). This is probably the most realistic study I have seen so far. Out of 500 shocks, only 5 were detected by the compressor, none of which caused harm. Most importantly (and not surprisingly) the CPR puck prevented any detection.

My expectation when we are doing CPR is, whenever possible, that we are using a feedback device, and we are using the manual monitor. Given the evidence, I believe that defibrillating while providing compressions on a puck (feedback device), with gloves, is safe. Providing compressions without the puck, although not ideal, is equally safe. Of course, nothing we do has a 100% safety margin. We still place IV's even though there is a risk of needlestick and we defibrillate on damp ground even though there is theoretical risk of current arc. Hopefully this helps provide the background surrounding my support of this optional practice, which should only occur at the discretion of the compressor. At the very least, consider charge-analyze-shock during every code.

Education Outside the Box - Online Videos

Brian Bartolick EMT-P, FP-C



This past spring, an article on podcasting for EMS was published in the DPM newsletter and I have heard a lot of good feedback. This is the second in a series of articles on non-traditional EMS education that highlight a few YouTube video series that offer plenty of useful information.

If asked, I'd confidently answer that almost all of my most influential teachers and educators throughout my life have been found in my EMS career, through classes or mentorship. I would be hard pressed to name more than one or two of my teachers from elementary school, and while I have good stories of my high school teachers, few have been influential. The best EMS educators not only know something you don't, but they want to share it with you. Many of these educators and mentors publish their information, and a relatively new medium to use are video series on YouTube that can be accessed anytime, covering a variety of EMS topics. Although a few of the videos are lecture format, because of the nature of the edited video, very few are dry or boring. Additionally, anyone with a Google account can subscribe to a series of YouTube videos and be updated via email when a new video is uploaded. I'd like to highlight a few specific video presentations that I have been following and frequently review.

First is our local video library on YouTube, posted by *Rochester EMS* at the following address: <https://www.youtube.com/user/RochesterEMS/videos>. This series is produced and presented by many folks that our regional providers will recognize, covering topics that not only pertain to MLREMS EMTs but also covering the specific protocols and policies. A note of caution here with the new collaborative protocols, some of the videos may be a bit outdated so be sure to always follow the most updated version. Speaking of the collaborative protocols, the learning platform *Cypherworx*, is being updated and expanded very frequently to allow for additional video learning relative to our EMS practice. Watch for more to come on that platform.

Another presentation that I don't miss is *EMS Medicine Live* found at the YouTube address: <https://www.youtube.com/channel/UCWHjRyL4jk6G44M-ZCEguPw>. *EMS Medicine Live* is so named because they present it live online monthly where you can listen and view the lecture and interactively ask questions at the conclusion of the presentation. Later, the entire program is uploaded to YouTube and subscribers are notified via email. This series is produced by Dr. Christian Knutsen from SUNY Upstate but is presented by different physicians and providers every month. Most of the presenters are semi-local from SUNY Upstate, SUNY Albany, UPMC, PENN and even our own Dr. Cushman from the University of Rochester. The topics are wide ranging but I learn something significant from each episode.

Dr. Peter Antevy presents a short but valuable videos with a pediatric slant. Entitled *Handtevy Minute*, look for it at: <https://www.youtube.com/user/TheHandtevy/videos>. The doctor has a propriety system that competes with the Broslow tape, but the series is not a sales pitch. There are many hints and reviews for pediatric medicine dosing as well as some tips and tricks for other aspects of patient care. An example video will show the skills of how to administer the dose of adenosine in an acceptable form to a pediatric using a three-way stop cock. There are many ways to accomplish this, but the doctor gives us another tool in our toolbox to perhaps make things easier for medical professionals.

If you're looking for a video that covers a specific pharmacology topic in a short time, check out *Propofology* at https://www.youtube.com/channel/UCH4UsUWp2RvKhYn_Anrga2Q/featured. This video collection has a decidedly anesthesia and critical care slant, but the topics can translate to EMS very easily. Some of the best titles include, *Physiology of Pregnancy in 5 minutes!*; *Effects of acidosis in 3 minutes!*; and the wildly popular: *Renin Angiotensin Aldosterone System in 3 minutes*. This was great for me to review a topic that never really received a lot of exposure, chest x-rays. Pun intended. Lots of the medicines we carry are reviewed in this series, and it serves as a great refresher for such things as norepinephrine and rocuronium. As always, a disclaimer: critical care and anesthesia use medicines in a way that differs from our formulary in EMS. Consult local protocols or your agencies medical/clinical department for local use.

Virtually any procedure, in our scope of practice or not, can be found on YouTube. A great example could be watching additional videos on patella reduction. Or, using the search bar, you can find a great video for Humeral Head IO insertion location. While these are good adjuncts to education, nothing beats hands-on learning with a peer, mentor, or the educator that was referred to in the first part of this article.

Finally, if you need a break from education and just want to relax for some time before the next emergency call, I very much enjoy watching various local ambulances and firetrucks responding to emergencies at this YouTube site: <https://www.youtube.com/user/FirefighterEmt4Life/videos>. Just like when we drive by a child and they wave, sometimes seeing a firetruck or ambulance drive by reminds us that we really have a great job.

For the fall, I look forward to reviewing non-traditional EMS classes held at our NYS and National Fire Academies.

Management of Chest Pains Patients Coming from Urgent Care

Heather Lenhardt MBA, EMT-P

Eric M. Thomas MS, PA-C, EMT-B



Doesn't it seem like you're dispatched to an Urgent Care facility for patients with chest pain more frequently? The number of EMS requests to Urgent Care facilities for chest pain is on the rise. Although these patients are already under the care of a medical facility, EMS providers still need to manage such patients with regional chest pain metrics in mind. Below, you'll find guidance on how to optimize care for these patients, whom in most cases already have their ALS work-up started.

Chest Pain Patient Metrics:

Metric	Goal
On Scene Time	10 minutes or less
At Patient to EKG Time	10 minutes or less
Prehospital Notification	Within 5 minutes of STEMI identification
Aspirin 324 mg chewed by mouth	**As soon as feasible**

Shall not compromise or take precedent over the aforementioned metrics. If contraindicated; supporting documentation is required in the patient's PCR.

How do you meet all these expectations?

If an EKG has been done by Urgent Care and a STEMI is present:

- 1) You may use the Urgent Care EKG to confirm the presence of STEMI. In which case the ALS provider should immediately notify the receiving hospital of the incoming STEMI while remaining crew member(s) can focus on expediently packaging the patient.
- 2) Confirm with Urgent Care staff that ASA has been administered. If ASA has *not* been given, it is acceptable to defer until the patient is in a moving ambulance en route to closest STEMI center (URMC-Strong, RGH, and Unity).
- 3) If possible, repeat EKG as soon as possible, but do not delay transport to perform a repeat EKG in the setting of an already identified STEMI.
- 4) Serial EKG's are advised as best practice for all patients with chest pain.

If an EKG has been done by Urgent Care and a STEMI is NOT present:

- 1) Confirm your interpretation of the absence of a STEMI, but obtain an EMS EKG as soon as patient is packaged and loaded into the ambulance.
- 2) Confirm with Urgent Care staff that ASA has been administered. If ASA has *not* been given, defer until the patient is in a moving ambulance en route to the appropriate facility.
- 3) Serial EKG's are advised as best practice for all patients with chest pain.

EMS 3.0: What Every EMS Leader Needs to Know

Reg Allen BS, NREMT-P

Chairperson of MLREMS and member of the EMS 3.0 transformation committee as a representative of the American Ambulance Association



Over the past 60 years or so EMS has often been seen as neighbor helping neighbor in communities across the country. While the core values of our EMS forefathers continues to permeate our agencies today, the winds of change are swirling fast and furious. EMS was originally designed as a means of getting a patient from where they fell ill or injured to the hospital in a rapid manner. In the infancy of EMS there really wasn't much actual patient care that happened in the ambulance. Over the years the EMS profession matured and along the way we became caregivers, without anyone actually asking us to do so. We did it because it is what is best for our patients and the communities we serve.

So we've matured, but our profession remains mostly a foot note in the vast healthcare system, which as we all know is in dire straits. Even more concerning is that our role as prehospital providers is not exactly clear to policy makers at the Federal level. In a conversation, where the benefits of paramedic care was being debated, it was stated "who ever asked EMS to treat the patient? EMS is paid to transport patients, that's it." It may have been said by a person in a Federal Government position, which should concern us all, if that's what the policy makers are thinking or being led to believe. As anyone in EMS knows, we are a transport benefit in the eyes of medical insurance payers, so why would anyone think otherwise.

We as EMS providers need to make a concerted effort to change the system's understating of our value so we are recognized as providers of healthcare vs contractors for medical transport.

There will always be a need for emergency ambulance service to care for cardiac, stroke, trauma, and such sudden illness or injury. However, EMS can play a much larger role in the healthcare continuum. The small amount that EMS actually costs insurers and the Federal Government is often referred to as "Budget Dust." However, our value is not really what it costs insurers or the Feds to pay EMS for transporting patients, but EMS can save healthcare dollars if our resources were brought to bear as a true partner in the continuum of care. The saving would be in the billions of dollars. Of course to have a seat at the "healthcare table", we need to do more than just provide great care and a ride to the hospital. We need to show VALUE and QUALITY within the continuum of care. Value may include: Community Paramedicine, emergency care and transport, alternate destinations, chronic disease management and support, post discharge follow up, and proper routing of low priority calls to perhaps a nurse advice line. There are numerous resources on how to prepare for our immediate future at the following website <http://www.naemt.org/2017/initiatives/ems-transformation>. I encourage you to get informed and stay informed of the EMS 3.0 movement. All of us need to prepare for the vast changes coming our way and we need to get involved in the change process

There is a complementary initiative called EMS Agenda 2050. Look for more on that in the next edition of DPM News.

The Power of Preparation

Christopher Galton MD, EMT-P



Take a moment and reflect back on the last cardiac arrest you ran. Step away from the patient's outcome and think more about the logistics of your call. How long did you spend on scene? How long did it take you to make the determination of DRT vs transport? What went well and what did not go well? Is there anything you can learn from that last arrest that will make the next one cleaner, more efficient, and possibly less traumatic on all the responders involved? Self reflection is a skill that is underutilized in EMS and is one method of improving our patient's outcomes and our satisfaction with the job.

Much earlier in my career, the staff that responded to a scene with me dramatically changed as the fire department I worked with transitioned from a volunteer department to career. Before the change, my ambulance partner and I were lucky to have one or two police officers and possibly a volunteer fire fighter that responded with us. Once the fire department transitioned to a career department, we had at least three firefighters and the one or two police officers. This change brought many benefits to cardiac arrest management, but also a few problems. Patients got earlier and higher quality CPR. Ventilation was consistent and patient movement was much easier with more hands. Initially this was a huge positive.

About six to seven months into the transition, I started to see some of the negatives though. The career firefighters were becoming more competent in their roles on scene, which meant they were focusing on doing their jobs to the best of their abilities. In the past, no one would touch my EKG machine or my jump bag. Now, the outstanding firefighters were moving equipment around to enhance their ability to perform their duties because their primary concern was to do the best job they could. They were focused on doing a great job, but at the expense of my equipment. Have you ever had the pleasure of turning to

do a rhythm check only to find that your monitor was moved out of the way by someone with the best intentions? How about reaching down to grab the next round of epinephrine only to find your med bag was moved out of the way to facilitate the long board coming in next to the patient.

Twelve months into the transition, the firefighters, my partner, and I realized that we needed to plan our cardiac arrests better. I sat down with a few of the force multipliers inside the fire department and we figured out how to make cardiac arrests work better for both the firefighters and the EMS staff. This took less than twenty minutes to talk through, and we followed that with a few hours of training. Most of this time was spent working through where people should place themselves relative to the patient. We went through many iterations of the plan and felt like idiots when we realized how many times in recent months that we had made easily preventable mistakes. If you regularly work with the same people, what is preventing you from planning ahead? If you don't work with the same people, having a plan and being able to provide clear direction is pivotal to your success.

The most polar end is the path that I took, which might be the right direction for many of you. I have planned my cardiac arrests out and continued to run those calls in exactly the same way for many years now. Let me give you an example. I am right handed and like to place external jugular IVs in cardiac arrests. I do this because it allows me to push medications and IV fluids through a large bore IV that stays close to the head of the patient. If the right EJ is plausible, I'm always on the right side, because it's easier for a right handed paramedic to stick the right side of the neck. Since I want to stick the right EJ, I don't want someone who is ventilating the patient to be on the patient's right side, so they are always placed on the L side. The person doing CPR is on the R side, which is far enough away that I have easy access to the right EJ or humeral head for an IO if necessary. The EKG machine is always on my left and the jump bag is always on my right. That's because I do my IV access on the patient's right side and crossing my body to get equipment from the left is a waste of time. I am very specific about not having anyone else touching my equipment because my process is very well choreographed (to the extent that my SEQ colleagues have made fun of me on more than one occasion). I carry a garbage bag in my jump bag so all my trash immediately goes straight into the bag and I can save clean up time. Being prepared and practicing will open your eyes to many mistakes that you have been repeatedly and unnecessarily making for years.

I don't think it's necessary for you to set your equipment up the way I do. In fact, different agencies have different equipment and layouts that might prevent you from setting your gear out in this manner. My way is not the best for everyone, but it's best for me because I worked through the glitches and took the time to practice it. You have no excuse for allowing your next cardiac arrest run to end up chaotic. You have the chance to plan ahead and your patients deserve the best chance at survival. Work through bag placement and personnel positions before you are actually doing it. Whatever your preferences are, set yourself up for success. Come up with a plan, prepare for your next call by practicing, and then enact your well thought out plan. You will be amazed how much quicker you can get on a scene, get things done effectively, then leave the scene after a high quality resuscitation. Preparation leads to a more satisfied paramedic and better patient outcomes, without question.

If you have any questions about this column, please feel free to contact me at christopher_galton@urmc.rochester.edu.

Assaulted on the Job... or Was I?

Eric Rathfelder MS, EMT-P, Police Officer



EMS providers deal with many dangers related to their profession including environmental hazards, dangerous pathogens, hazardous materials, repetitive stress injuries, and unpredictable patients. Nearly every provider I know has been struck, hit, kicked, spit on, or otherwise abused by a patient or bystander at some point in their career. In this article, I will provide an overview of the common NY Penal Law charges that apply to these circumstances and attempt to clear up some misconceptions. Please keep in mind, I am touching only on narrow subsections of a few laws in order to focus on the most common situations EMS providers face and I am not addressing existing case law that might provide important guidance on the interpretation of these laws. Additionally, every situation is unique and should be investigated by the law enforcement agency with jurisdiction where the incident occurred. In any situation where you are the victim of a crime, it is your decision whether or not you want to pursue charges against a suspect, if charges are appropriate.

In New York, violations of the law are divided into three major categories: violations, misdemeanors, and felonies. Technically speaking, violations are not classified as “crimes” but they are still punishable by a fine or jail time.

	Violation	Misdemeanor	Felony
Maximum punishment	\$250 fine; 15 days in jail.	\$500 fine; 1 year in jail.	Dependent on “class” of particular charge.
Can juvenile be charged	No	Yes	Yes

Harassment 2nd (violation)

“...with the intent to harass, annoy or alarm another person (1) He or she strikes, shoves, kicks or otherwise subjects another person to physical contact, or attempts or threatens to do the same...”

This charge is commonly appropriate when an individual kicks, punches, slaps, or spits on you.

Assault 3rd (class A misdemeanor)

“...(1) With intent to cause physical injury to another person, he causes such injury to such person or to a third person...”

In order to understand this charge, we need to understand the NY Penal Law defines *physical injury* as *impairment of physical condition or substantial pain*. Physical injury typically involves an injury such as a cut that requires treatment (sutures, staples, Steri-Strips), a broken bone, a significant strain/sprain, a black eye, etc.

Assault 2nd (class D felony)

“(1) With intent to cause serious physical injury to another person, he causes injury to such person or to a third person; or (2) With intent to cause physical injury to another person, he causes such injury to such person... by means of a deadly weapon or dangerous instrument.”

In order to understand this charge, we need to understand the NY Penal Law defines *serious physical injury* as *physical injury which creates a substantial risk of death, or which causes death or serious and protracted disfigurement, protracted impairment of health or protracted loss of impairment of the function of any bodily organ*. Serious physical injuries include: loss of an eye or limb, brain damage, removal of a portion of an abdominal organ, etc. Hopefully, it would be a very rare case where an EMS provider sustains serious physical injury as the result of a deliberate attack (or physical injury as the result of an armed attack) but there is another section of Assault 2nd that is applicable. Essentially, if a first responder (police officer, EMT, paramedic, or firefighter) sustains *physical injury* in a situation where an individual is attempting to prevent them from doing their job, the charge elevates from Assault 3rd (misdemeanor) to Assault 2nd (felony).

The most common misconception I see in circumstances where an EMS provider or firefighter is attacked is the belief that the provider has been the victim of a felony assault even though they have not suffered an injury that rises to the level of *physical injury* as defined by the NY Penal Law. In these circumstances, the provider has been the victim of a Harassment 2nd and the law does not provide any enhanced charge for Harassment 2nd against a first responder.

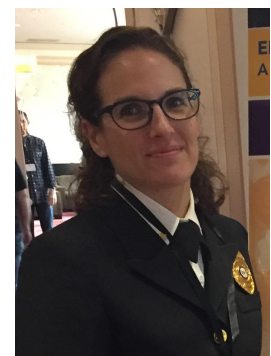
Another common oversight is of the phrase, “with intent”. Sometimes, EMS providers suffer an injury or a harassment in a situation where the patient doesn’t intend to injure them. For example, the extremely demented nursing home patient who strikes you when you are trying to transfer them to the stretcher. While I can’t imagine any provider pursuing charges against this patient, it probably wouldn’t meet the criteria of Harassment 2nd.

As a profession, we should strive to minimize attacks on EMS providers by constantly looking for danger at scenes, observing our patients for pre-attack cues, incorporating appropriate resources into our scene management, practicing good deescalation techniques, employing appropriate mechanical and chemical restraint methods, etc. If you find yourself in a situation where you have been attacked by a patient, I hope this brief overview of assault and harassment helps you understand some of the legal ramifications of the situation.

Introducing . . . Dr. Maia Dorsett

What brought you to URMC?

I began to look at URMC after my husband applied for a job at the University of Rochester. I was incredibly impressed with the large, active division of prehospital medicine and academic emergency medicine program. I was particularly excited by the variety of backgrounds and interests of the members of the DPM, which I think is a robust model of providing medical direction, education, and quality improvement within the local EMS community.



What is your role with DPM?

I would say that my current role is to provide support for the educational and clinical missions of the DPM. I did the entirety of my clinical training in Emergency Medicine and EMS in St. Louis, MO and I am brand new to the rules and regulations of the New York State. My hope is that in the first year I will assimilate into the practice of New York state prehospital medicine. In the meantime, I will be assisting

in creating educational content for paramedic students, prehospital providers and emergency medicine residents and starting some new research projects.

Are there any areas of special interest or particular passions you have related to prehospital medicine?

I have two inter-related passions in EMS: quality improvement and education. I came to EMS pretty late in my training. I was never a prehospital provider. Emergency Medicine was sort of a surprise career choice. During residency, I became very interested in processes to improve patient-centered outcomes - not only at the individual level by addressing the complexities of our patients' lives outside of the hospital - but at the community level as well. It was then that I did my EMS rotation. As I watched paramedics and EMTs go into patients' homes, counsel them on their chronic conditions and treat their acute ones, I caught the EMS bug. Since the foundations of good clinical care are based in education and positive change relies on QI, these became my areas of focus during fellowship.

What do you like to do outside of work?

Pretty simple here: Be a mom. Garden. Bake.