Home Health Wound Care Review

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- [Jessica] Our presenter today is Dr. Tracey Collins. Tracey Collins is an assistant professor at the University of Scranton since 2002, a geriatric certified specialist since 1998 and a PRN home and hospice PT for VNA of Lackawanna County. She has worked in home health for 24 years. Dr. Collins received her entry level PT degree from the University of Scranton in 1989. An MBA from the University of North Carolina at Wilmington in 1997 and a PhD in health administration from Walden University in 2006. Thank you so much for joining us today at physicaltherapy.com Dr. Collins. At this time, I'm gonna turn the microphone over to you.

- [Tracey] Thank you. I'm happy to see a whole bunch of people joining us. It is a noontime here in Pennsylvania, and we're going to begin our Home Health Wound Care Review. I chose this topic because I think many of us learned wound care in school and maybe have been in different settings and didn't use it very much, but now that you're in home care, you need to use all your skills necessary to be part of the team, to take care of your patients for the best possible outcomes. The learning outcomes that I expect you to achieve by the end of this course is identify at least two characteristics each for all stages of pressure injuries. I'd like you to be able to identify at least two characteristics and standards of care for a given type of wound that we talk about today.

Just describe at least three indications for various types of wound dressings. Define at least three forms of debridement and indications for each, and finally identify at least four aspects of a wound care evaluation. So let's begin with our introduction, the importance of skin, okay. We're talking about the integumentary system today in wound care. So your skin is the body's first line of defense against the external environment. Skin protects the body from chemicals, ultraviolet, rays, and physical harm. It also provides numerous homeostatic functions, including fluid regulation, electrolyte balance, thermoregulation regulation, acid base balance, and sensation. But

for many of us in home care, the majority of the patients that we take care of are older adults, 65 and older, so their skin has different characteristics. And we need to think about that the protective factors will be compromised if they have decreased fluid intake or dehydrated, they have cognitive changes. Their nutrition is not adequate, they have poor nutrition, their mobility is reduced, or they could have chronic conditions that further exacerbates skin concerns for the older adult. If they are diabetic, if they're obese, if they have malnutrition, dementia, vascular disease, if they have renal failure, history of smoking, any chronic exposure to air pollution, hormonal changes and extensive skin exposure. So structural changes in the aging skin. What happens to your skin as you age, you have a decrease in thickness of the epidermis, which functionally results in impaired barrier function and it's more prone to dryness. There's a decreased number of endocrine glands resulting in impaired thermoregulation. The dermis becomes thinner, a cellular and avascular resulting in susceptibility to injury and impaired injury response. You'll see this very typically these are the patients that have what we call tissue paper skin, very thin. You just, their hand hits a doorway or an assisted device and you'll get a skin tear.

So that's an obvious example of the structural changes in the aging skin. They also have atrophy of cutaneous fat and it makes the tissue underlying it susceptible to injury. So we are part of home care OASIS-D is part of our life in home care and many therapists do complete the OASIS admission, readmission, discharge. So, integumentary system is part of this evaluation. So I did go ahead and list all of the M questions that are part of the OASIS-D so I think it's important that hopefully this course will kind of remind you and teach you how to answer these questions most accurately. So the first is M1306 unhealed pressure injury at stage two or higher. So you need to know what a stage two or higher is. The oldest stage two pressure injury. M1311, the current number of pressure injuries at each stage. M1322 the current number of stage one pressure injuries. M1324 stages of the most problematic pressure injury. If it is indeed stageable. M1332, the current number of stasis injured ulcers that

are observable that you can see, and M1334 status of most problematic stasis ulcer that is observable, and then surgical wounds. We do need to assess those as well. And the last is M1342, the status of the most problematic surgical wound that you can observe. Sometimes our surgeons use non-removable dressings and we can't observe them, but hopefully we can. So now we're gonna move on to a wound care examination, a thorough examination of a patient's wound. This may not be something that you do in home health, but you should be able to do it.

You are part of the team taking care of the patient who has a wound. So the patient history, what are there any diagnosis in their history that would make them more susceptible to any sort of wound? Okay. Pressure wounds, arterial wound, venous stasis wound. Is there anything in their history that precludes them to those things? And then you wanna look at this current wound, its history, how long have they had it? Do they know what caused it? Is there anything that has gotten better or worse? Has it kind of stayed stagnant, kind of stuck where it is and it hasn't gotten any better? Have they gone to a wound care center?

Many of our patients I know here where I live in Pennsylvania go to wound care centers once a week, have they indeed been to wound care center for this wound before? And who is actually taking care of the wound? Is it a primary care physician? Is it podiatry who is actually taking care of this wound? And then you want symptoms of the wound? Does it cause the patient, any pain, discomfort, anything like that? Have they had previous treatment? Many of our patients have, you know, they have chronic wounds kind of on and off. And so what have they had before and what worked and what didn't work and then medical treatment, have they had any medical treatment related to this wound, especially if it's an arterial wound, have they had any vascular surgery to improve the circulation in that extremity? What medically has been done for that wound and cultures? Has the wound been cultured? The drainage been cultured to know if it is indeed infected or not. Has anyone done that? Have they had any

special tests or anything done related to this wound or the exterminatus the wound is on like x-rays, bone scans, any vascular testing, have they have Doppler studies done? What have they had done all important things to know. Now, so the subjective information in your wound care evaluation should first pain. You know, we know Medicare loves pain and it's another vital sign. So we need to think about, is this one causing them any pain? Do they have any parasthesia in the area and does their pain change with any change in position? If they elevate it? If the extremity is dependent, at rest, or maybe with activity, does their pain change. So you need to ask your patient all of these questions. So the wound care examination, objective information. There's a lot of things we need to evaluate here.

The first is location. Location of a wound tells you a lot about what caused it or its etiology. If it's over a bony prominence and it's round it's most likely a pressure injury. Okay? If it's on the medial lower leg, it's very often a venous, also. So location does give us a lot of information. So when you're measuring your wound, they have nice things to measure your wounds with. You can overlay a piece of cellophane over the top to measure a wound, but you first, you wanna get the length and the width and depth, but the length and width you need consider where are they length is its longest point, you can use the numbers on the face of a clock to determine where that wound is longest for its length and width. Where is it?

It's widest. Look at the numbers on the face of a clock to determine how you would document that. And then you can measure depth and typically use the sterile Q-tip to get the depth. And if you can describe where in the wound it is, that depth came from where it is indeed it's deepest. You wanna go ahead and document that if your facility allows you to take, agency allows you to take pictures. Pictures are wonderful as well. You just wanna make sure that if someone else saw this wound on the next visit, they would have an idea whether it's better or worse. Okay? Now, if it is a pressure wound, a pressure injury, you can stage it. And we will talk later about the stages of pressure

wounds. And you wanna classify the wound. Is it a venous wound, an arterial wound, a pressure wound, neuro pathology, is it a diabetic foot ulcer or is this a surgical wound? You wanna describe the wound base? What does it look like? What color is it? And then look at the edges of the wound. Are they dry? Are they, is there a lot of erythema? Describe the wound base and the edges. Then you wanna consider drainage exudate. What color is it? How thick is it? Does it have an odor related to it? All important pieces of information, then you wanna describe the peri wound area and often even measure it. Okay. If there's a large area of erythema around the peri wound area, you want to go ahead and measure that because the wound could be, the wound itself could be very small in its dimensions, but there's a large peri wound area that is very inflamed and that could open up very quickly. So you need to, you need to go ahead and measure the area of erythema around the edges of the wound and then you wanna consider edema. Do they have edema in the extremity where this wound is located? You can also check their sensation. You also want to consider, especially if it's a lower extremity wound, there are peripheral pulses. Are they indeed intact?

Can you palpate them? Did you need a Doppler to actually hear them or not? So please make sure you check your peripheral pulses in the lower extremity. And is there, erythema in the area of the wound at all. And again, how much? Then you're gonna go to tissue composition and what we mean by this. You wanna report it in terms of percentage, what percentage of the wound is good, healthy red granulation tissue? What percentage of the wound could be black or necrotic tissue or what percentage of the wound is just fibrin and yellow? So you wanna put a percentage on the wound. So someone else who would look at the wound would know, okay, well, this wound only has 10% necrotic tissue, or it has 50% necrotic tissue try and use percentages to give a more accurate description of the tissue composition of the wound. Okay? So now we're gonna review the drainage descriptions. So serous or transudate. It should be clear or amber in color and it's composed of water and some electrolytes. If you describe it as your serosanguinous it's viscous, it does contain plasma proteins,

neutrophils, and dead cells. If it's purulent or pus these are colors we don't wanna see because generally means the wound is infected. It's generally thick, yellow to brown or green in color, and it tends to have an odor and again, mean that it is infected. So you want to denote the color and how thick the drainage is. You also wanna consider what phase of healing is this wound in? Is it an acute wound? It's in the inflammatory phase, it will be characterized by reddened tissue, some drainage, some warmth, some pain and loss of function. The main function of this phase of wound healing is to remove debris from the wound.

Okay. So if it's a very new wound, you know how long they've had it, is it in this acute phase? Does it have these different characteristics associated with it? Where is it in the proliferative phase? This is tissue repair through production of granulation tissue. Fibroblast migrate into the area and produce and create collagen and the wound at this point tends to start to contract or pull together. So you should be able to tell if the wound is in the proliferative phase. The last phase is the maturation phase or remodeling. This is the process of remodeling the connective tissue and scar formation happens in this phase. This is the final phase of wound healing. What you always need to remember is that a healed wound is never as strong as intact skin.

So it will be then indeed more susceptible to injury in the future. It only has 75 to 80% of the tensile strength that normal skin has. So keep that in mind, if patients have healed wounds, that that skin will be more susceptible and we always need to be thinking about no matter what type of wound it is, what are the clinical signs of infection? Okay. If the patient has malaise, if they have a lot of pain in the area, if there's odor to the drainage, if the drainage is thick, tan, green, yellow, brown, and again, do they have a fever? Another sign of infection could also be an elevated heart rate. You know, we're supposed to be checking vital signs. So if their heart rate is elevated and you check their temperature, they have a fever and they show some of these other signs of wound. It could be clinically infected and that should mean a call

to their physician. And also let's the nurse that is in on the case, know about the suspected infection, sorry. And again, they're case managers should also be notified so that the patient can then have this wound cultured and taken care of and maybe even be seen by the wound care center whoever's managing the wound. There are standards of care for all wounds. The first is that we need to make sure that our patient has good nutrition, good nutritional status. Are they eating well? Are they eating a lot of protein? We know we need those things and they need to be well-hydrated for these wounds to heal. You also need to debride any devitalized tissue, any necrotic tissue, any yellow slough off of wound. If you don't debride these devitalized tissues away, the wound will not heal and you don't want it to close that way either. You also wanna make sure the wound stays clean, okay. And also a moist environment. And you need to make sure they also any suspected infection is verified and taken care of with antibiotics or the appropriate dressing.

Okay.So now we're gonna move on to pressure injuries and in home care, we do see pressure injuries. We can get patients from other settings to home health that come to us with pressure injuries. We would hope these don't happen. But unfortunately they do patient goes into the hospital to have a knee replaced and they come out with a new knee, but they also come out with a pressure injury on their heel. We would hope those things will not happen, but so we're gonna review pressure injuries for you. So the definition of a pressure injury is localized damage to the skin and underlying soft tissue. Usually over a bony prominence or related, it could be a device that is not fitting them well, an AFO, something that they're using on a daily basis, is not fitting well could also cause a pressure injury. It can present as intact skin or open ulcer and can be painful. And sometimes patients initially will say, oh, my heels are burning. You know, they don't feel right. It's usually a result of intense and prolonged pressure or pressure in combination with shear. Now pressure injuries themselves tend to be round. But if there's a shearing component, they can be a little bit more elongated or even look a little triangular in shape if there's a lot of shear going on and you'll see

shear oftentimes with patients who cannot mobilize themselves very well, and they slide down into their chair or slide down into their wheelchair and then someone comes and scoots them back every time they do that, that's a shearing force. Or if, when you reposition them in bed, if you're just dragging them across the surface, that is again gonna cause shear to the skin. Okay. So remember, just looking at a wound. If it is round, if it's over a bony prominence, it is most likely a pressure injury. If it's more elongated, it could also have some shear component to it as well. So let's get into the definition of each stage of a pressure wound. A stage one is intact skin with localized are of non-blanchable erythema.

And it can appear a little bit differently in dark darker pigmented skin. The presence of blanchable erythema or changes in sensation, temperature or firmness may proceed any visual changes that you see and color changes should not include purple or maroon. 'Cause these could indicate a actual deep tissue injury. So stage one, I've had patients in home care, tell me, oh, you know, I know they sit a lot. They're up in ambulatory, but they do sit in their chair a lot during the day and they will tell me my tailbone is burning. Okay. And, and you know, as physical therapists, we need to evaluate integumentary system.

So I'll say, well, I need to see that area. And you go look and you know, maybe indeed you do have non-blanchable erythema and it's a stage one. And hopefully you can advise the patient to change their position more regularly, get up and walk more regularly. So you can stop this pressure injury at this stage. And it goes no further. Stage two, this is partial thickness loss of skin with exposed dermis. The wound bed is viable pink or red moist, and may also present as intact or a ruptured blister. Okay. Adipose or fat is not visible in this stage and deeper tissues are not visible and granulation tissue slough and eschar also not present in a stage two. Usually results from adverse micro climate and shear in the skin over the pelvis, sacral area, and the heel. Okay. So if your patient's telling you, their heels are burning and you know, look

at their heels. If it looks like a blister or a ruptured blister, that is indeed a stage two. And hopefully you would advise them to unweight that pressure injury. So it will go no further than a stage two. Then we get into a stage three. This is full thickness skin loss. Your adipose is visible. Fat is visible. Granulation tissue and rolled edges are often present. There can be slough, yellow slough or eschar can be visible. These are the wounds at stage three, these are the wounds that have depth. They have measurable depth. And this is when physical can be involved in the treatment of wounds. There could be also undermining and tunneling in these wounds, but understand it at this stage the fascia, muscle, tendon, ligament, cartilage, and or bone are not exposed yet. If slough or eschar obscure your ability to see how deep the wound is, then it is gonna be classified an unstageable pressure injury. Stage four, this is full thickness skin and tissue loss. You're gonna have exposed fascia, muscle, tendon, ligament, cartilage, and or bone there's slough and eschar are visible they can have rolled edges. There can be undermining.

There can be tunneling. And the depths can vary depending on where the wound is located. If there's too much slough or eschar covering the surface of the wound, then the extent of the injury would be then considered unstageable. Unstageable pressure wounds are full thickness and skin tissue loss in which the extent can not be confirmed because it has slough or eschar. If the slough or eschar is removed a stage three or four pressure injury will be revealed Now stable eschar that we tend to see on the heel it's adherent, it's intact without erythema should not be softened or removed. It should be left alone. Pressure injury classification it's intact or non-intact skin with the localized area of persistent non-blanchable, deep red, maroon purple discoloration, or epidermal separation revealing a dark wound bed or blood filled blister. Pain and temperature change often proceed these color changes. The color changes can appear differently with patients who have different or darkly pigmented skin. These result from intense and prolonged pressure, especially for your patients who cannot reposition themselves, or maybe they can't reposition one limb themselves or any shearing forces

that are happening while they're being assisted with their mobility. And they can evolve rapidly to reveal the actual extent of the tissue loss. But if necrotic tissue, subcutaneous tissue, granulation tissue, fascia, muscle, or other underlying structures are visible, this does indicate a full thickness tissue injury. Do not use this classification to describe vascular traumatic neuropathic or dermatological conditions. One thing I wanna say about pressure injuries, because we do work with nurses a lot in home health is we classify a wound. If it was a stage three, it's a healing stage three. We never downstage wounds in PT, in wound care, but nurses do so sometimes you're saying the same thing, but they're calling it a stage two while you're calling it a healing stage three. It is healing but if it was a stage three to begin with, it's a healing stage three.

Okay. So what causes pressure injuries we would like to prevent these? So let's think about the things that cause them. Extrinsic factors that cause our tissue loading or external pressure, that's a primary factor. Friction and shear can also play a role. Temperature, a very warm temperature. If their skin is very moist and sometimes equipment can also cause them. Extrinsic factors are muscle atrophy, certain medications that they may be taking if they have malnutrition and some medical conditions can also be intrinsic factors, such as AIDS, diabetes, and central nervous system damage. So how do we prevent pressure injuries?

You need to keep the patient's skin clean and dry. You need to check their skin, especially if it's an extremity, they cannot reposition themselves. They can't move themselves. You need to be checking it. If they, complain of, you know, their heels burning or their sacrum burning, and they cannot reposition that area of their body themselves, you need to be checking their skin and then advise position changes at least every two hours. If they are sitting up in a wheelchair, we know that Roho cushions and gel or combination cushions are actually the best at relieving pressure. But we know, unfortunately that too many insurance companies do not wanna pay for

these higher end wheelchair cushions until they actually have a stage three pressure area. So we'd like to let them to not get to that, that point at a stage three or higher. You can have your patient's weight shift, you know, shifting their weight from side to side in sitting and do like a wheelchair press up to unweight the area. Sleeping surfaces. They may need a low air loss mattress. If they're at highest risk. And we do see those used in home care. They need to have, make sure they're eating well, good nutrition, good hydration. They're controlling moisture. If they are indeed incontinent, this can be an issue for especially sacral ulcers. You know, we have to keep them clean and dry if they are indeed incontinent and you wanna make sure anything underneath the patient, there's no wrinkles, there's no folds, there's no seams in the clothing. Anything that can prevent pressure. So our highest risk for pressure injuries are anyone who has a lack of protective sensation. They can't feel the pressure.

So they are most at risk. If they have neuropathy, if they've had a stroke, if they've had a spinal cord injury or a traumatic brain injury, if they're immobile as a result of any neurological deficit or any acute orthopedic injury or coma, if they can't move an extremity and they can't feel the pressure, they are at higher risk. If they have very poor nutrition, if they are indeed incontinent, if they have uncontrolled sweating or moisture issues. And also if they have muscle and skin atrophy, where only prominence is very prominent. So what is the standard of care for pressure injuries? Number one, you have to relieve the pressure. If you don't relieve the pressure, the wound will never heal. You need to control the moisture. If they are incontinent, they need to be kept clean and dry. Nutrition, they need to make sure that they have enough protein, vitamins, mineral intake, enough albumin, and they should be checked and you might need to get a dietician involved to make sure their nutritional status is indeed adequate. Wound infections need to be diagnosed as quickly as possible and treated. Don't let it go on and on and on without if you notice they're showing signs of infection of this wound, it needs to be taken care of as quickly as possible. And you need to have wound care that's clearing the debris from the wound, getting all the necrotic tissue off. You need

dressings that absorbed drainage well, if there is indeed a lot of drainage and facilitates formation of granulation tissue, and your dressing are gonna be chosen based on the characteristics of the wound. And we will talk about those later their specific function, ease of use and what is available to your patients. So standard of care for pressure injuries and positioning, you want them in as normal sitting posture and supported as possible. In supine, you want the heels off the bed or use of pressure relief, AFOs. Hip and knee flection of 25 to 30 degrees and limit the time in this position. If they're at risk for sacral issues, use a quarter-turn back using wedge gets the patient off the sacrum, or you can use a quarter-turn front using a wedge or body pillow gets the patient off the sacral as well.

And patients should be repositioned at least every two hours to prevent pressure injuries. So further standards of care for pressure injuries, relieving the pressure with appropriate positioning and sitting in line. A moist wound environment, adequate nutrition, protein, vitamins, minerals. Okay. Before we go on to this case study, I do have a question from Ann and the question is if acute phase has red tissue and more of how do we differentiate if it's infected? Well, you would look for other signs of infection. You would look for elevated temperature, you would look for the drainage to be thick, yellow, tan, green, brown.

Okay. So you're looking for other signs of infection and sometimes if they have an infection they can also have an elevated heart rate as well. So you're looking for those signs as well, to differentiate between an infected wound versus an acute stage wound. I hope that answered your question Ann. So now we're gonna look at a case. I tried to give you cases throughout every section of this presentation to get you up applying it and thinking about what we just talked about. So Mr. B is a 60 year old with a chronic right ischial issue, wound pain in his right side and elbow. His past medical history includes is a quadriplegic, secondary to spinal stenosis, circle myopathy and spinal stroke. Noninsulin dependent diabetes it has a suprapubic catheter. He sits in

his wheelchair 12 hours a day, cause he's still working. And I gave you the measurements of his wound. Okay. And he does have some undermining at two o'clock the wound treatment he's currently getting is calcium alginate, peri wound barrier and absorbent cover dressing changed QD. So our intervention for this patient is he's basically, he was sitting up in a wheelchair 12 hours a day, and the wheelchair was no longer giving him adequate support and positioning. So he needed to have the wheelchair re-evaluated and you really need someone who specializes in wheelchair seating to help you with this. For custom, this gentleman needed custom counter backrest with deeper and more contoured, right thoracic for more support, he needed a lateral hip guide to get his pelvis more level. And he needed a center amount of footplate to improve his thigh alignment. His wheelchair cushion was also changed to a powered alternating pressure wheelchair cushion, and the firmness was then adjusted to level out his pelvis to make the pressure across his pelvis more even. The wound dressings remained unchanged.

After 10 weeks his pain had decreased significantly. He was in a much more upright position with decreased pressure over his right ischium. And the wound measurements decreased significantly and the undermining decreased significantly and the healing in this case, this gentleman was quite involved, but it was attributed to not only the wound care, but also the equipment changes that were made. This is a gentleman who sat 12 hours a day. And if his wheelchair was no longer appropriate in giving him the support he needed, that needed to be fixed as well to alleviate some of the pressure over the right ischium that had caused that pressure injury. So a lot of people were involved in helping this gentleman heal this wound, not just the PT, not just the wound care center. You also had someone who's wheelchair seating specialist involved to try and improve this situation and reduce the pressure, so the wound would indeed heal. Okay. Now we're gonna go into venous stasis ulcers. These are some of the most common ulcers we see, I know my students go to a wound care center every spring, and I always ask them, what type of ulcers did you see? And they always tell me

venous stasis. So these can be very chronic. They're a very common vascular condition. And they increase as a patient ages. And the actual definition is a full-thickness defect of the skin most frequently in the ankle region that fails to heal and is sustained by chronic venous disease and some patients that they are not compliant with the treatment of these wounds. These can go on for years and years and years, I've had patients that they've had them on and off for as long as 10 years. So they're an economic and social burden to both the individual to have to be going to wound care centers every week for months and years and the healthcare system. And they're very recurrent in nature because patients sometimes they're not compliant with what they need to do after it heals.

So the characteristics, how we can determine if it is a venous ulcer, they're more shallow, the not usually too painful. And these have ischemic kind of scars on their leg, they can vary in size greatly. And usually fashion, deep structures are not exposed. The borders of these wounds are very flat. They're very and sloping into a very shallow crater. They tend to, these are the wounds that are very wet. I've had patients that they tell me their socks are wet all the time, because these sorts of wounds are draining all the time and the peri wound tends to be very wet. These can develop very slowly, but they can last for years.

And they tend to have repeated episodes of infection and cellulitis. And because it's down in the ankle region, they can have loss of ankle range of motion and strength, which will then in turn affect their gait. Some tests that are typically done to determine if they have a venous ulcer is a venous Doppler, a Trendelenburg test or a Cuff test. Standards of care for a venous ulcer. And we are a part of this even if we are not treating the wound directly. They need to have dressings that are absorbent enough that they're not soaking through and macerating the good skin. Compression therapy is also a part of this to decrease the swelling in the affected lower extremity. And then having your patients elevate their lower extremities. Like you're done with therapy with

them, make sure they're elevating their lower extremities when you're done with them and also consider their ankle range of motion. What is it on evaluation? And with a wound down around the ankle and try and improve that and walking and stretching is also important. Many of these patients, if they do put them in a Unna boot or something, compressive walking is important to make that Unna boot work better and get the swelling up out of the leg. But once the healing, once the wound is completely healed. They're most likely gonna be measured for a compression stockings to prevent reoccurrence to keep the swelling out of the leg. You don't keep the swelling out of the leg. They're gonna come back. So this is when many patients start to not be as compliant. They don't wanna wear them because they're hot and they're uncomfortable and hard to get on. So this is why many of them reoccur. So we're gonna look at a venous stasis ulcer study. This case study, this patient is 62 with an ulcer on the left medial ankle. It's been present for months.

And the patient has had ulcers in the same location in the past, not a lot of pain, three out of 10 increases with prolonged standing. The drainage is moderate to heavy. And the peri wound area is macerated, or all soft and wet. There's no evidence of DVT infection or arterial compromise. There is swelling in the left calf two centimeters greater than the right and the range of motion, a five degree plantarflexion contracture. So they don't even have full dorsiflexion range of motion. So how can we best take care of this patient? Intermittent compression be received for 30 minutes every day, he was given a hydro fiber dressing, which is highly absorbent and an Unna boot, which was changed weekly. At the wound center the wound was cleaned with pulse lavage, ankle stretching was also part of his intervention and also a walking program. So what happened after two weeks? The drainage reduced considerably. The peri wound maceration was resolving because if you've got a dressing that is absorbent enough, it will help that peri wound area 'cause all the excess drainage won't be leaking out onto the good skin. After several weeks ulcer healed, the patient was then fitted for custom gradient support stockings to be refit six to 12 months to prevent ulcer recurrence.

Okay. Before we go on to arterial ulcers, I have a question from Ann. Undermining can you please describe, okay. Sometimes people have a difficulty differentiating between undermining and tunneling. Undermining is when maybe the wound, the open area is quite small, but when you press on the skin around the peri wound area, it's very soft and you can tell, and you can see sometimes that all the tissue is absent underneath the skin and the peri wound area. Where tunneling is actually a narrow, usually thin area of tissue loss going away from the wound. So I hope that helps figure out the difference between undermining and tunneling. Now we're gonna go on to arterial ulcers. The characteristics. These are painful ulcers. These are much more painful than a venous wound. The relieved by a dependent position.

The pain actually increases when you elevate their lower extremities, they have cold feet or numbness in their lower extremities. They tend to have intermittent claudication when you ambulate with them. The location of arterial wounds is typically our anterior tibia, latter leg or distal toes. These patients can also have gangrene. The wounds tend to be pale in color, generally dry. There's not a lot of drainage. These are much deeper than a venous wound. And these are the patients. When you check the peripheral pulses, they have a decreased or absent pulse.

They tend to have decreased hair growth on that lower extremity. And the skin tends to be very pale and they have muscle atrophy in the area as well. Arterial ulcer tests, an ankle brachial index. If it's less than 0.8 indicates poor circulation and rubor of dependency. If they're leg it's very red when they're in a dependent position and it tends to be painful in that position as well. So standards of care for arterial wounds, stable eschar that you typically will see on like a heel cap should not be debrided until healing potential and profusion have been confirmed. Can it heal before you would start messing with it? And they have to have an ABI less than 0.8. You have to have a moist wound environment for these wounds. They tend to be very dry. So you need to use something that is gonna keep it moist. Hydrogels hydro means water. And

whenever you see hydro in a name that that's giving it moisture, your hydrocolloids will also do that. And anything that's impregnated with these gels, will also keep the wound moist. You need to prevent infection of this wound and you need to protect the wound. Because again, the area is really quite painful. You need to moisturize the peri wound area. It's gonna be very dry, make sure the patient is having their nails clipped by a podiatrist. And also that they're wearing supportive footwear with adequate depth shoes. You wanna avoid anything that's gonna provide any compression, like dress stockings or restrictive clothing that provide compression to that lower extremity. If they have arterial wounds down on their toes, you wanna use a bed cradle to keep the sheets and blankets off of their feet, 'cause that would be very painful. If it's touching those necrotic areas and you want protective devices for the feet and ankle, 'cause you'd like to maintain that range of motion of the foot and ankle. You might use a profile boot something to keep it in normal alignment so they won't lose more range of motion. And it also they're padded.

So it will protect it. So lets look at a case study. Arterial ulcer is this gentleman's 80 years old. He's seven week history of a non-healing sore on his left anterior shin. he got it after he bumped his leg on a concrete slab. His past medical history includes renal insufficiency, high blood pressure, 120 pack year history of smoking and carotid endarterectomy. So his history even shows you that he could have some arterial issues to begin with. So when evaluating the skin his lower extremities are pale with little hair growth. He's got thick yellow toenails, wound dimensions given three centimeters, 1.4 by one, it's deep to the anterior tibial tendon. The wound base has vibrant and pale granulation at the margins and he's got scant cloudy serosanguinous drainage. He's got a foul odor and then he's got a two centimeter ring of erythema around the wound. And his pain is very high, 10 out of 10 with this arterial wound. So some recommended tests and measures. You need to assess his vascular status in this lower extremity, your distal pulses, ankle brachial index, rubor of dependency, claudication. How far can he walk before he starts getting intermittent claudication? And you're also, he

should have blood work done, including a white blood cell count because this wound is presenting like it may be infected. So you wanna make sure that is done. If he has not never had a vascular consult, he does need to go and have Doppler studies done to check the vascular status of his lower extremities. This patient also needed antibiotics cause this wound was indeed infected. He was given a silver impregnated hydrogel silver because it's infected and the hydrogel to keep the wound moist. We will review dressings a little later in this presentation and a foam dressing because again, padded and a little bit more protective of the wound.

He received irrigation, sharp debridement of the necrotic tissue. He was given a walking boot to protect the exposed tendon and he was giving a walking program with PT his education included, smoking cessation and good nutrition. If the infection or necrosis advanced, he should be referred back to advanced vascular surgery for providing more blood flow to the lower extremity. I don't see any questions from that section. So if there are any, please ask before we move on to a diabetic foot ulcer. So why do diabetic foot ulcers happen? What's the etiology? Usually the number one thing is sensory loss loss of protective sensation.

They can't even tell if they're stepping on something that could injure their foot. Mechanical stresses of the foot can also cause a problem. Foot deformities, poorly fitting shoes or repetitive stresses. Also high foot pressures at the first metatarsal head and great toe are the most common areas you are gonna see diabetic foot ulcers. And they tend to have dry callus skin, can also have obesity, visual loss and joint limitations that make it difficult. They can't do a good inspection of their feet every day. Like we would like our diabetics to do so that they could actually see the bottom of their foot and do a good foot inspection and look in between their toes and look for any problems before they become too great. So how do we prevent foot ulcers? All your diabetic patients really should be seen by a podiatrist. And I know even my own family physician, he has a sign up in his office that says, if you are a diabetic, please remove

your shoes and socks cause they wanna do a foot screening. And I think that's great that they do that. We should be thinking about that as well with our diabetic patients and ask them, do they do a foot? Do they evaluate their feet? Do they look at their feet every day and inspect it and make sure they don't have any issues. So any risk factors they need to manage and identify. You need to educate your patients on how to screen their feet. How to look at their feet, use a mirror to look at the bottom of their feet in between their toes. Make sure they're wearing proper footwear. I've worked with many patients and sometimes the families just think, Oh, we'll just get a bigger shoe or, you know, instead of an appropriate fitting shoe, like extra depth or something. And sometimes that can cause more problems because of shoe is not fitting and it's causing more rubbing and problems. Daily self-inspection of the feet. We talked about that and they need to manage any minor foot problem and get to a podiatrist or their physician to manage those. And joint range of motion of the foot and ankle is also important, making sure that they are maintaining not only their ankle range of motion, but range of motion of their toes and their intrinsic strength in their feet.

And you can again, talk to them about the dangers of smoking. So how do we examine the foot for a diabetic foot ulcer? when you're looking at their history, look for things that are causing them more risk, whether they're smoking, whether their blood sugars are not well controlled, get a history if they had a problem of this before you can do sensory testing for the Semmes-Weinstein filaments. If the patient is unable to feel the tangy they have loss of protective sensation and they're at risk for a diabetic foot ulcer, you're looking for redness, callus, increased temperature, any ulcerations on the bottom of their foot swelling and any macerations. You're also gonna check the strength and range of motion of the foot and ankle. You're gonna identify any deformities in the foot and ankle. You're gonna check for those peripheral pulses, checked for their vascular and look at their footwear. I always, you know, take a look at the shoes that they wear most often and see the wear pattern on them and see how they are fitting. 'Cause they could be part of the problem as well. So for diabetic foot

ulcers, the Wagner grading system is used very often. And a zero on this scale would mean the patient has intact skin. A one would mean a superficial ulcer. Two, would be a deep ulcer. Three, would be a deep infected ulcer. Four, would be partial foot gangrene and five would be full foot gangrene. Another scale that is typically used is the University of Texas classification system for a diabetic foot and has stages and then grading. So stage A is no infection or ischemia. Stage B is infection present. Stage C is ischemia present, stage D is infected and ischemia. And then there's also grading. Grade zero is epithelialized wound. A grade one is superficial wound. A grade two is when penetrates to tendon or capsule and a grade three is the wound penetrates to bone or joint. So just be consistent in which scale you are using with your patients. The characteristics of a diabetic foot ulcer, usually no pain cause they've a lot of them have lost protective sensation. Located on the plantar surface of the foot.

The peri wound area tends to be very calloused with a nice callous ring right around it. They tend to be round small and deep and frequently they're infected. So the standards of care for diabetic foot ulcer, you have to offload the pressure on that wound and you have to have good blood sugar control, both are essential to getting these types of wounds to heal. So there's many devices to offload stress on the foot. Total contact casting is like the gold standard.

It is very time consuming and there aren't a lot of people that are trained there are therapists PTs that are trained to do this. But there's not a lot of people that are trained to do total contact casting, but it is the gold standard. It works very well to offload the stresses of the foot and it's kind of difficult for the patient to take off. So there tend to be a little bit more compliant. There's also walking splints that you can take on and off, which is a little easier. You don't have to have someone specially trained to apply it like you do total contact casting, but the downside is patients can take it off if they don't like how it feels and you know, they can just remove it whenever they want. And then you no longer have any offloading of that wound. There's also Darco shoes. The

problem with Darco shoe is they do affect your balance because they're changing where you're getting pressure through your foot and it can make it very difficult to walk like that. And if your patient already is at risk for falling a Darco shoe is probably not what you would want to prescribe. Then they have the plain postop shoes. Again, they don't really offload the stress that much. And there's also wound healing shoes that you can actually remove little cells in the shoe to offload exactly where the wound is located. So prevention of reulceration, this occurs very often. So you really wanna make sure that once the wound is healed, you fit them with protective footwear, that they slowly resume ambulation. You know, just like when you get a new pair of shoes, you only wear them a little bit at a time. So slowly resume and too much walking too soon could result in neuropathic fracture or Charcot foot. And there is a Charcot Restraint Orthotic Walker that puts pressure through the tibial plateau to reduce some of that stress. And you wanna improve joint mobility in the foot to reduce enrage stresses during ambulation.

So again, look at the ankle and foot as well for optimal range of motion and strength will also help these ulcers from reoccurring. Okay. So we're gonna go to the diabetic foot ulcer case study, and then I'll answer a question that's been posted. So this patient is 58 years old with pain and swelling in her right ankle for the past two weeks. Her past medical history does indicate she's diabetic times, 13 years. She has high blood pressure, osteoporosis and high cholesterol. She smokes half a pack of cigarettes for the past 40 years. She went to the ER, 10 days ago, x-rays taken were negative and she was given a diagnosis of cellulitis. She had antalgic gait without an assisted device. Her right foot was warm to the touch with redness around the ankle and dorsum of the foot. She was unable to feel the tangy monofilament sensory testing on either foot. Her dorsalis pedis pulses was intact, right greater than left. Her right foot did have a temperature increase of six to eight degrees warmer on the tarsal region. So what was her diagnosis? Her diagnosis was suspected early Charcot foot fracture should be evaluated with MRI to clear to make sure you don't indeed have a fracture

there, a stronger pulse and elevated temperature on the right also point to a suspected early Charcot foot fracture. So that needs to be cleared with MRI. 'Cause x-ray sometimes will not catch that type of fracture. So intervention that she received, she was partial weight bearing with crutches or a rolling walker to offload the foot. She was given total contact casting until her temperature readings lower to within three degrees of the left and her incorrect diagnosis in the ER, delayed the offloading of the affected joint. And you also want her to keep her blood sugars within normal range. So this, she won't continue to have problems. So she didn't have an ulcer yet, but she did have the beginnings of a Charcot fracture. So let's answer a question from Janet. So on the Wagner scale osteomyelitis with deep ulcer is a grade four. Yes, that is correct. Okay. Now we're gonna go move on to surgical wounds.

I know many of you may be treating patients. They come out of acute care, either post orthopedic surgery. They've had a hip replacement. Patients had a knee replacement or hip fracture or any other surgery. They can have surgical wounds. So first you need to think about and you need to make sure you document the type of wound closure that was used. Okay. Some surgeons are using sutures. Some are using staples, some are using glue and measure the length of the incision.

And if they have staples count the number of staples that are there and describe the type of closure, if it was not staples and also verify when the staples or sutures should be removed. Usually the surgeon will put that in their orders, you know, 10 to 14 days, but please always make sure the patient has that appointment because I have had patients that they never had an appointment and then the staples have been in too long. And then the skin is growing around the staples, and then it was much more difficult to remove them. I know PTs in the state of Pennsylvania can remove staples, but again, that's dependent on whether the surgeon wants you to remove them or they want them to come in the office and have them removed. The incision should be cleaned daily with saline and readdress depending on the physician order, just follow

the doctor's order. But there are some surgeons that use these non-removable dressings. So the patient can shower more easily. The downside to that is we can't see what's going on underneath the dressing. If the patient does have any complaints about the wound or you see drainage coming from underneath that non-removable dressing, you do need to remove it and inspect that wound and let the surgeon know what's going on. So the status of surgical wounds. Newly epithelialized wound bed is completely covered with new epithelium. There's no exudate. There's no avascular tissue. So that means there's no eschar or slough. There's no signs or symptoms of infection. A fully granulating means the wound bed is filled with granulation tissue to the level of the surrounding skin.

There's no dead space, no avascular tissue, meaning eschar or slough. And there's no signs or symptoms of infection. The wound edges are open in this case. Early or partial granulation is when the wound bed is only covered with 25% or more of granulation tissue. And there could be there's less than 25% of avascular tissue or that black eschar or yellow slough. There are no signs of symptoms of infection. And the wound edges are open.

A non healing wound is a wound that's greater than equal to 25% avascular tissue that black eschar or yellow slough, there's signs of symptoms of infection or clean, but non granulating wound bed or closed with hyperkeratonic wound edges or persistent failure to improve. You know, it's kind of a chronic wound. It's not changing. It's not healing despite appropriate wound care management or standards of care. Okay? So we're gonna return to our types of debridement. We were talking about surgical or sharp debridement using scalpels, currettes, scissors or forceps. PTs are trained in doing this, but very often our home health patients are receiving this type of care at a wound care center once a week by the physician. But there are other forms of debridement there's mechanical using mechanical sources, and it can be just soft abrasion, wiping the wound with gauze. That's a form of mechanical debridement, wet to dry dressings,

you know, they go on wet, they dry, they stick to the wound. And when you tear them off, that is a mechanical source of debridement. Hydrotherapy or whirlpool was not used very often today, but again is a mechanical source. Pulse lavage with suction is also a source of mechanical debridement. There's also autolytic debridement to help remove the necrotic tissue and yellow slough, the use of, and you do that through moisture retaining dressings, like hydrocolloids to facilitate the body's own enzymes to break down the necrotic tissue. If the wound is indeed infected and unable to use a hydrocolloid, you can use saline moistened gauze and in a film or hydrogel, if moisture is retained. There are also enzymatic ointments that can help break down thick eschar they get into eschar itself and start, and you can also do some crosshatching on that to help get the ointment into the eschar to break it down.

There's also a biodebridement that just means using sterile maggots in the wound bed itself to clean it up. And many of you might think that's sounds really yucky, but it's really quite effective. The research says it works really well to clean up a necrotic wound. So why would you sharp debride? Well, you need to get rid of the dead or unhealthy tissue because it will just harbor bacteria. You needed to debride 'cause I aids enzymatic debridement, sharp debridement can less traumatic form of debridement.

And you can also minimize bleeding because it's very selective, your only debris eating away that portion that you see as necrotic, you're not just pulling off a dressing and removing everything that that dressing stuck to. And you can remove a large amount of dicrotic tissue with sharp debridement. And it can also speed up the healing, especially for a wound that's kind of been stuck and it's not advanced in stage of healing. Why would you not sharp debride? Well, if the patient has arterial insufficiency, you would not use sharp debridement 'cause they don't have enough blood flow to heal. On a heel ulcer we typically would not sharp debride if that eschar is stable, it's non-reactive, there's no erythema around it. You just leave it alone. If the patient can't

cooperate and be still, and if healing is not really the patient's goal, you wouldn't do sharp debridement. If there's a high risk of infection, you would not do sharp debridement. If you're doing sharp debridement you'd have to refer back to the physician. If bone artery or vital structure was exposed through debridement, they would need to evaluate that situation. So what are contraindications for sharp debridement? When would you never wanna do it? If a patient has arterial insufficiency, if they have gangrene, if you never debride something, you can't identify the structure. If they're all sort of stable like those heel ulcers, the eschar is just like a cap over the heel. It's very stable. If you cannot visualize the area debriding you can't tell what's there. Then you should not be debriding that area. So I don't see any questions. So we're gonna move on to a debridement case. This is an 80 year old with a chronic venous stasis ulcer medial left ankle, 80% necrotic tissue, heavy drainage that is tan in color length is five centimeters with three centimeters depth 0.5, two plus edema on the left, one plus on the right.

Patient being treated by the family physician for the past three months with no change in status. Now a chronic wound is defined as any wounds that has not improved in 30 days. So this is definitely a chronic wound. And they've been treated by the family physician for three months. So they were their intervention. They definitely need to be referred to someone other than the family physician, because this wound is in a chronic phase. They're referred to a wound care center for debridement of the necrotic tissue. They had a great deal of necrotic tissue. They had a CBC and cultures of the wound for a suspected infection. They were given an algInate dressing with silver algInate because they had very heavy drainage and algInate can absorb a lot of drainage and silver because it was infected and a name brand of that was Maxorb and it was cut to the size of the wound. So you wouldn't have any macerations. Then an Unna boot was applied over the top. Alginate would absorb all the exudate. And then the Unna boot provides compression, especially if they they're walking and PT was consulted to get this patient in a walking program. And then the patient was also instructed to elevate

their lower extremities to reduce edema. So again, anytime you see a patient with a chronic wound like that, that is not healing over 30 days, they might need to go to wound care center or see someone else because the family physician may not be able to handle that at that point, I have a question. So we're gonna read it and answer it. Can you do debride a granulation tissue that is beyond the level of the skin? Granulation. Good, healthy granulation tissue is not something you wanna debride away. You want to only debride away, necrotic, black necrotic tissue or yellow slough. If it's healthy granulation tissue, you wanna leave it alone. Okay. I hope that answered your question. Okay. Now we're gonna move on to just going over. Various types of dressings are so many out there.

I tried not to include name brands, but I think you need to understand the pros and cons of each type of dressing, what they're for and what they're not for. And cause if your patient has a dressing, that's not working well, it's gonna take longer for the wound to heal. So we're gonna go over different dressing types. Gauze. Everyone's familiar with gauze. It comes in so many different shapes and sizes two by twos, four by fours, kerlix and cling. It's highly permeable to air. It readily absorbs things. It allows for rapid moisture evaporation.

But if that dressing is not changed a lot, the wound can dry out that way. You can use it for wet to dry dressings, you know, where you wet the one four by four, put it in the wound bed and then cover it with a dry four by four, wrap it up with a cling or a covering, but it's not the best way to debride, wet to dry dressings. 'Cause when you pull that off, once that dressing dries, it's gonna pull everything off, even good granulation tissue. So not the most selective way to debride using wet to dry dressing with gauze. You can pack gauze loosely for tunneling or undermining. So it can be used that way as well. And a lot of gauze is cheap. So it's probably the cheapest type of dressing out there. That's probably why it is used. So it's advantages is it's cost effective. It's readily available. You can get gauze dressings in Walmart or CVS are

readily available. You can use gauze with an infected wound. Some of the disadvantages there's you can't really see the wound bed. When you're using gauze dressings. It is permeable to bacteria and can increase risk of infection in that wound. As it dries out, it can stick to the wound and the wound can get dry itself. And we know that's not good for wound healing for the wound to be dry. You want a nice moist environment. Now non-adherent dressings. These are like, the center of a bandaid. That's what a non-adherent dressing looks like. Non-adherent pads. It limits the risk of the dressing, sticking to the wound itself. It can be impregnated with petroleum. And in that case, one of the most common foams is zero foam. It's kind of yellowish. Some physicians will use it after surgery, but it's got petroleum impregnated in it and it's is non-adherent.

You have to have another dressing to go over top of this or a secondary dressing to hold it in place. It does not absorb very much. So we tend to use it for skin tears, donor sites, skin grafts, or when the intact skin around the wound is very fragile and may tear easily. You would use non-adherent. So the advantages of a non-adherent dressing, it does not stick to the wound bed. So it is not painful when it's removed. You're not doing mechanical debridement when you pull it off. Disadvantages. What if it's impregnated with Vaseline like in zero foam that may not be biocompatible to the wound.

So it might cause some irritation in the wound for some patients. So the next category of dressings we're gonna talk about is hydrocolloids. The one you've probably heard of most often name brand is do a DuoDERM or Exuderm. These are occlusive, okay. They stick right on the wound. They're not permeable to air, water or bacteria. They can absorb minimal to moderate amounts of drainage or exudate. It does provide a more moist wound environment, but the gel in the dressing itself becomes pus like and appearance and odor. So when you remove these types of dressings, they will have a very unpleasant odor. We typically use hydrocolloids for stage two to stage four wound

for chronic wounds. Any wound with necrotic tissue that require debridement partial and full thickness wounds, high friction areas, such as the sacrum, and they can be used with an Unna boot as the dressing underneath the Unna boot. Advantages of hydrocolloids are they promote autolytic debridement of minimal to moderate amounts of necrotic tissue. They can be comfortable. They're easy to apply. The body temperature is maintained in the wound. Some disadvantages of hydrocolloids is the dressing interacts with the wound fluid and can leave a residue in the wound or on the margins. That can be difficult to clean up when you're gonna do a dressing change. Now maceration of the peri wound tissue can occur. If you do not cut these dressings to the size of the wound, if you just put on a big sheet of hydrocolloid DuoDerm you can macerate all of the peri wound area when you do that. So you need to try and make sure you cut this type of dressing to the shape of the wound. And you might have to use some sort of skin sealant or skin protectant on the peri wound area to prevent that maceration.

But the big disadvantage with hydrocolloids is they cannot be used with an infected wound. Okay? 'Cause they hold all that in and it holds all the infection in. So these are really should not be used with a wound that is infected. Okay. So the next category is semi-permeable films. These are semi occlusive. They can provide a nice moist environment for that wound. They're elastic and comfortable. You can see through them, which allows you to see what's happening on the wound. They're water resistant, which is great. If patients wanna be able to shower, they're semipermeable to moisture, vapor, and oxygen and occlusive to bacteria. So they keep bacteria out, but they don't absorb anything. Okay. They can't absorb anything. So when would we use them, you're gonna use them on superficial wounds and burns. These are great for skin tears. And you'll see them used very often on a skin tear, especially on the back of the hand. They can be used on a postop wound site, a donor graph. They can help hold a primary dressing in place. So these could be used as a secondary dressing. And these can also be used over a blister or a stage two to protect that skin until it can heal. One

of the more common name brands of a semipermeable film is Tegaderm. So you may have heard of Tegaderm. My dad just got a skin tear a couple of weeks ago and I told my mom to go get one of these. And she put it over his skin tear and he kept it on a week and she could see it and it healed up. And when she removed it, she was amazed how nice it looked. So, and you can actually buy these films at the drug store and you can buy them sometimes at Walmart. So they are pretty available. So the advantages are that you can visualize what's going on with that wound. It keeps the moisture and provides that moist wound environment. It facilitates autolytic debridement. It does hold in moisture so and it can cause macerations, if the size of the film you're using is going out onto healthy skin. These can be a little difficult to apply because they're so thin that they can stick to themselves and then fold up and then you're done and you have to get a new one.

So that can be a little tricky to apply just because they are so thin. And this is not gonna because it is so thin, it's not gonna hold up in a high friction area like the sacrum. Okay.And the body temperature is not maintained in the wound with a semipermeable film and they don't absorb anything. So will not be used in that case. Now your hydrogels you're gonna use hydrogels. They have a high water content. They're very comfortable.

They hold moisture in, they are permeable to oxygen. You're gonna use them when the wounds need moisture, especially like those dry arterial wounds. You're gonna use them on burns, superficial abrasions. They work good. These can come in like just a gel itself. They can come in sheets that can be cut to the size of the wound. They come in many different forms. They can used in combination with ultrasound treatments, you could put a wound gel in the wound and do ultrasound over that. Or you could, you just put an ultrasound sheet over the wound and do ultrasound as well. Hydrogels can be used on infected wounds. So you'll typically know it's a hydrogel by looking at the name of the dressing, the brand name, 'cause it usually has aqua or which means

water in it. So, or it could be called a wound gel, some disadvantages of hydrogels and sheets. The advantages are it promotes autolytic debridement. It is effective in assisting with the eschar removal. It's not adherent. It's not gonna stick to the wound. The disadvantages of these hydrogels are they can dehydrate easily and they can be difficult to keep in place. You might, need a secondary dressing to go over the top of this to actually hold it in place where you want it to stay. The next category is semipermeable foams. Some of the most common name brands are Mepilex and ConvaTec Aquacel. These the properties that are prevalent with the semipermeable foams are moisture retentive. They hold the moisture in that wound in, their permeable to moisture, vapor and oxygen.

They also come in many different shapes and sizes, either sheets or something that you could pack or fill a wound with. They can be used for partial or full thickness wounds, and they can absorb moderate to maximal drainage. Okay? So they're a good filler dressing to absorb a lot of drainage that might be occurring in that wound and sheets can be used as a secondary dressing. So they come in both forms, something that you can fill the wound with and also a sheet that you could cover the wound with or a secondary dressing.

So the advantages of semipermeable foams are there's no irritation of healthy tissue. When you take it off, it's not gonna stick. It holds the body temperature in the wound. It promotes the autolytic debridement and it keeps that moist wound environment. The disadvantages of it is you can't see into the wound bed. You can't see what's going on. So the next category is alginates. Alginates are derived from seaweed and they promote autolytic debridement. These will absorb a lot of exudate and protects the healthy tissue. It keeps the wound moist. It does turn to gel. When it comes in contact with the wound exudate, you have to use this on a wound that is moderate to maximum drainage, and it should be used on wounds that are stage two to four. The advantages of alginate they're easy to use. They come in a lot of different forms. They

come in rope for a tunneling wound. They come in like cavity fillers. So there's many different forms. There's no irritation when you remove an alginate, you can use these on an infected wound. There's no usually discomfort or maceration with these wounds, but the disadvantages are, they're unable to keep the bacteria out and you have to use a secondary dressing or a dressing to cover the wound. The next category is collagen and these are derived from bovine hide. They may stimulate new tissue development and wound debridement. They will absorb exudate. Your wound must have drainage for you to use this. The advantages of collagen. They're easy to use. It's not irritating to remove it.

The disadvantages of collagen and you cannot use it on a dry wound. Those dry arterial wounds. You cannot use it on that. Or if a patient has a known sensitivity to bovine products, you could not use that. Biologic dressings. These are derived from human or animal sources. They're typically used for very large wounds or large burns. Biologic dressings the advantages are they prevent water loss. The provide a flexible wound covering. The scaffolding promotes neovascularization and new dermal growth. The disadvantages of biologic dressings is they're not available a lot because they cost a lot of money and some facilities don't wanna use anything that's that high cost.

And you can also have graft rejection in a skin graft from biologics. Silver dressings. These are that you're gonna use on infected wounds. So there are dressings that are combination that could be like alginate and silver. So you could use anything that is silver and is used for patients that their wound is infected. The advantages of silver dressings is they come in all different forms. They come in paste, they come and alginate, they come and gauzes they come in different shapes, they come in rope, they come in you could fill a wound with it. The disadvantages of silver dressings is the high cost. So we'll do the case. And then I see some questions and I'll answer the questions after we go over this dressing case. Okay? So this is a 67 year old with a venous stasis ulcer two years in duration. So definitely a chronic wound being treated by us podiatrist

with wet to dry dressings, presented to the ER with excessive purulent drainage and suspected infection. The peri wound area is macerated for 1.5 centimeters. The intervention this patient received first, they did blood work, CBC and cultures for suspected infection. His dressing was changed to Aquacel Ag Extra Hydrofiber, which is an alginate with silver. So the alginate to absorb a lot of that drainage and the silver, because it was infected. And then they applied an Unna boot over the top of that to give the compression, because this was a venous stasis ulcer. This patient was referred to the wound care center and home health for nursing and also PT. So we're gonna answer, we're gonna start with Ann's question. She'd like the names of the semipermeable foams again. I'm looking some of the name brands of the semipermeable foams are Mepilex M-E-P-I-L-E-X and ConvaTec Aquacel. Hope that helps. Okay. Next question is Janet. So what'd be the best choice for a sacral pressure ulcer when the patient is incontinent? Well you have to also look at how much drainage there is in this wound to determine if it is moderate to heavy drainage.

You wanna use something that is gonna absorb it like an alginate, but then you might wanna consider something. That's not gonna let bacteria in. Like a film, a semipermeable film, as long as you can keep it in place. So you have to look at more than just the location of the wound, but also other characteristics of it. Before you decide on what dressings you're gonna use. Okay. The next question is from Tracey, are there time recommendations for changing these different types? A lot of how often they're changed sometimes depends on how much exudate the patient has in the wound, because you don't want the dressings to become saturated. If they become saturated, then they need to be changed because they all that moisture will macerate the good healthy peri wound area. So sometimes that is determined by how much drainage they have. Unna boots tend to be changed every week, but they can, some patients will have so much exudate even with the alginate that it is seeping through. And then it, when that happens, whoever put the dressing on whether it was the wound care center or the home house nurse needs to be contacted. So that can be

changed. 'Cause you don't want that excess of exudate to macerate the rest of the wound. Things like wet to dry dressings tend to be changed once a day, twice a day, because they dry out. Hydrocolloids are changed every couple of days. Again, based on the amount of exudate and avoiding maceration of the peri wound area. The next question is from Marie, can you give an example of biologic dressings? I'll have to see what I can find here for you. 'Cause we don't use biologic dressings that often because they are so very expensive. So a lot of facilities don't even use biologic dressings just due to the high cost. And if they had to be changed very often that.

I did a search for biologic wound dressings and I did not find any name brands, I think because they so high in costs. But if you're unsure of the type of dressing your patient has, it should be in the nurse's notes. The nurse should know what type of dressing it is. Just be very careful with biologic dressings, just due to their high cost that you're not removing it sooner than it should be. And if you're unsure, you can always contact the wound care center. If the patient is going to a wound care center. Are there any other questions about dressings, please feel free to ask any other questions that you have.

So we're gonna summarize a little bit and just talk about our role in wound care. Home health wound care it should be interdisciplinary even if we are not the primary person caring for the wound, you should know the standards of care for each type of wound to be able to identify each type of wound. Because if you were filling out an admission OASIS or discharge, you have to be able to answer those questions accurately and completely. You are part of the wound care team. So if you notice a patient's dressing is they just had it put on yesterday. You know what day they go to the wound care center or your nurse changes the dressing. We know that excessive exudate will macerate the good healthy peri wound area. So you need to notify the nurse and or the wound care center. So maybe the frequency of that dressing change could be made more frequently 'cause we don't want more tissue damage to be done. Cause

sometimes we see the patients more than a nurse does and certainly more than the wound care center does. So you need to keep your eyes open. Don't be just because we're not maybe taking care of or treating the wound. We are part of the team that cares for these patients. And we should be looking out for all of the issues that they have that is within our scope of practice and wound care certainly is. And we can help be the eyes and ears of the wound care center and the RN from home health if she is doing the wound care, when they are not there. And you should be evaluating a patient's integumentary system, if a patient tells you their heels are burning, their sacrum's burning. And you know they're, you know, they're immobile, they can't reposition that lower extremity where the heel is burning or they, you know, they sit a lot.

They don't get up and walk a lot, take a look at that skin. If we can catch it at a stage one that is to that patient's benefit. Than if you ignore it and just wait til it becomes a stage two or three. Okay. So be part of the team here and evaluate your patients to take a integumentary system especially for your patients who are higher risk. If they are diabetic, they have decreased sensation in the area. They've had a spinal cord injury or have neurologic deficit, please make sure you're looking at their skin. And we would like to prevent this stuff before it becomes more involved.

You should know the type of wounds your patient has and the treatment to help ensure that the patient is doing what they're supposed to be doing for our venous stasis ulcers. We know they are very chronic and patients can have them for years, usually because they're not compliant. They're not doing what they're supposed to do when they're not at the wound care center, but we could be in there seeing them. And if you can just encourage them to do what they need to do, you know, any time they're sitting, they should elevate their feet. They should, if they're supposed to be doing intermittent compression at home, make sure they are indeed doing it. We are trained in how to do that. You can help them, you know, make sure they're doing, being

compliant. And also for our venous stasis wounds. Some patients that are an Unna boot is applied and it's very important that they walk with an Unna boot 'cause that pressure helps get the edema out of their lower extremity. We also, for patients that are immobile, even if it's just immobility of one lower extremity from an orthopedic injury, we want to instruct caregivers on prevention of pressure injuries. You know, if they had their knee replaced and they can't move that lower extremity, well get the heel off the bed, you know, roll up a blanket or a towel or something, get the heel off the bed. So you're not causing pressure And you really should report any new integumentary issues to the patient's nurse, their case manager and their physician.

As soon as you suspect it, I mean, we could be the first one to see a new stage one stage two or worse. So we tend to see patients more often than the nurses and definitely more than their physician. So be part of the solutions to prevent these pressure injuries from advancing. Okay. So we have a few more questions. One from Rosemary. Hyper granulating tissue infection type of debridement. I'm not sure of your question Rosemary hyper granulating tissue to prevent that from happening or infection. We just wanna keep wounds covered and clean.

They should be cleaned after every dressing change and type of, I'm not sure what you mean by type of debridement. We went over the different types, would you mean it in what terms do you mean type of debridement? Tracey has a question back to sharp debridement. What depth is it true to get deep to... Well sharp debridement you only wanna debride necrotic black or yellow eschar if you cannot not identify a structure, do not debride it away. Okay. You need to be able to identify muscle tendon bone. Those are, you know, only debride necrotic black or yellow eschar hope that answers your question. You don't want to... When you're sharp debriding, you don't, you never take a sharp instrument and go deep into the wound. You always just wanna stay close to the surface and you don't wanna poke into things you basically, you cannot see, okay, you don't wanna do that. If you can't see it, you can't identify it, and you don't wanna

cause injury or debride anything away that you don't, that is good, healthy tissue. Let's see Rosemary asked what is course of treatment or dressing for... I'm not sure what you mean. If you could type the whole question in that I would be able to answer it better. Oh, for hyperpigmentation. Hyperpigmentation, sometimes you can prevent it. If you, as the wound heals and is completely sealed, you can do like cross friction massage over the wound to stop that hyper granulation. But you have to wait till it's closed specific dressings for hyper granulation? I'm not sure of, or not familiar with but I'd be happy to look that up for you if you would like to contact me after.

Okay. So we have some time left. So we're gonna go over the exam questions. The location of a wound may provide information about? A measurements, B depth, C radiology or D eschar. So we said that a location of a wound very much tells you about why it happens. So etiology. So the correct answer would be C. Okay. She's putting in the next question, which pressure injury is pictured? Okay. So look at the picture and see if you can determine we said at stage one its just the skin is red and it does not go away. Stage two is, can look like a blister or an open blister.

So there's no depth to a stage two. We said at stage three is full thickness. You can see fat, you can see other tissue, but when you get to a stage four is when you can see muscle, tendon and bone. Okay. So the correct answer for two, because it was full thickness through the skin. It was a stage three. The next question, the 62 year old with a wound on the plantar surface of her left foot. She denies pain, which of the following is part of the standard of care for this wound? The correct answer is C 'cause with this sounds like a diabetic foot ulcer, the gold standard is offloading that area of the foot. So the correct answer is C. The next question is four, 70 year old with irregularly shaped wound on his right medial ankle swelling causes very little pain, constantly wet and seeping. What is part of the standard of care? This sounds like first identify the type of wound. It sounds like it's a venous wound, right? So we know that elevation and compression are the gold standard and standard of care for a venous wound. So

the correct answer is A. Question five, is a 59 or with a painful wound on right anterior lateral leg. It is dry with a pale base, 70% yellow necrotic tissue, which of the following is part of the standard of care. So if we look at how this wound is described, it's painful and we know arterial wounds are very painful. The location also tells us it's arterial. And it is also a dry wound with necrotic tissue, which also this is an arterial wound. So the standard of care is you have to debride away the necrotic, 70% necrotic tissue and provide a moist wound environment with a hydrogel and also protect the limb. So the correct answer is B. Question six, which of the following primary dressings would be the best choice for a stage three pressure injury with very heavy drainage.

We know that the dressing that provides the best absorption of very heavy drainage is our calcium alginates. So our correct answer would be B. Question seven, which of the following would be the best choice for a secondary dressing or something to cover for a sacral pressure injury. If the patient is also incontinent? The answer, the best answer would be A. Semipermeable film because it would not allow any bacteria into the wound because the patient is incontinent.

So the correct answer is A. Question eight, which form of debridement is the most selective? And the answer is B sharp debridement, because you are selectively choosing exactly what you're gonna debride from that wound. Question nine, changing wet to dry dressing a example of which type of debridement? And the answer is D mechanical. Because when you remove that, when that wet to dry dressing dries onto the wound bed, and you pull it off you're mechanically debriding it. Question 10, your patient has a deep ulcer on the plantar aspect of the right foot with osteomyelitis which Wagner grade would it be classified? And the correct answer is C. okay. Let's we have a question up here from Angelina. Our agency does not use PTs for debridement in the home. Is this a common? Most agencies do leave wound care up to RNs And a lot of times the sharp debridement is left up to the physician at the wound care center. But I like you to know why it's useful because you're gonna be taking care of those, those

patients coming back from wound care centers that I know in the state of Pennsylvania, and I know PTs can do sharp debridement, but home health agencies typically do not use us for that skill, but we do take care of these patients. So I think it's important for you to know the different types of debridement that are occurring because you might need to refer your patient to a wound care center so they can have that type of debridement done. If other forms have not worked in the past well. Okay. Let's see if there's any other questions. Okay. Some other questions about wound care and home health. I know some agencies will use a physical therapy to do dressing changes on days that we are there and we are certainly capable of doing that. So if it would reduce a nursing visit, that's gonna help your agency a great deal. I know even 18 years ago, when I left North Carolina, the agency I worked for was starting to get therapy involved in wound care.

And I know with PDGM you know, we need to use our license to the best of its ability. So we really need to use all of the skills that we have available to us and wound care is certainly, certainly one of them. And I know with patients, who've had joint replacements, many agencies don't send a nurse at all. So it is our job to evaluate that surgical incision, every time we go and to clean it, and even if the physician okays it and allows you to remove staples, I know in Pennsylvania, PTs are able to remove staples. So that is something we can do in home care as well.

And you need to think of wound care integumentary with all of your patients, especially your very sedentary patients, because they can develop pressure injuries very quickly, once they're at home. And they can, you can be part of the solution by identifying it when it's a stage one and instructing them how to relieve pressure throughout their day, whether it's sitting or laying in bed, you were certainly trained in how to do that. So we wanna make sure that you're not ignoring the integumentary system, because it is very important. It is within our scope of practice. You do need to consider your patients with wounds, even though you're not treating them, that you make sure they

are following the standard of care. And if they are not going to what you feel is an appropriate type of physician or to a wound care center. Maybe they're not going to any of those things. You can certainly instruct and advise the patients, maybe especially with chronic wounds to have them looked at by someone who is maybe more knowledgeable than the family physician. 'Cause that family physicians are the ones that tend to send patients to home health. At least where I work. A lot of our referrals come from family physicians. So if you can, you see a chronic wound, it's not healing. Maybe that patient does need to go to see someone else, or at least if you think it's infected, at least getting the family physician to culture a wound. I've had this happen in the past, I had a patient that had her knee replaced and it got infected. The first time she went through all the IV antibiotics and then had it, had the total knee new one put back in that one, I was seeing her and her wound was very small. It was like one or two centimeters, but she had tan drainage coming out of it. And tan is not a color we wanna see because it's indicative of infection and the orthopedist did not even want to. He just thought, oh, let's wait and see, let's wait and see, but this went on for a month and a half.

And I told her, this is a chronic wound. So we did finally have the family physician get involved and he cultured the wound it was infected. And then she went to an infection control physician. So she could be put on the appropriate antibiotics and then even sent to a different orthopedist in a different practice to see what the options were longterm. But because this patient had already had two knees get infected. The second opinion basically told her that they didn't wanna do any more surgeries on this knee, that she would need to be on antibiotics for the rest of her life because of this knee. And they didn't wanna pursue any further surgery. So basically you're part of the interdisciplinary team that takes care of every patient in home health an integumentary is very much a part of things that we see and help your patients and be an advocate for them to get the best available care that they can, even if you're not actively taking care of that wound, you can work with the RN. If she's taking care of the wound, you can

work with their physician to get them the care that they need because an infected wound that goes on and on like that, the last patient I described, she could have gotten septic from that wound. And she indeed had been septic before. So that is a life threatening event. And we can be part of the solution to stop that from happening with our patients on an everyday basis. You should be holistic in your care and not just look at the musculoskeletal issues with our patients, the mobility things with our patients, but also look at the integumentary system and be alert to patients, new complaints of things that are related to the integumentary system, and then instruct them accordingly.

If it's a pressure injury that they, you teach them how to relieve the pressure. If it's a chronic venous stasis ulcer that you are having them elevate their feet, they are having the dressings changed frequently enough that they're not getting maceration. If it's an arterial wound, that you are protecting that joint and maintaining the range of motion in the area to the best of your ability within the patient's tolerance and where there diabetic foot ulcers, that you are having patients that are diabetic, teach them how to inspect their feet between their toes and to wear footwear all the time. So they're not gonna step on something and cause a wound down their foot 'cause they may not even feel it. So it's your job to encourage patients to do that. We would like to prevent a lot of these wounds if we can. And I think we are part of the solution cause PT has a frequency much higher than most nurses and definitely physicians and wound care centers. So you need to keep integumentary always kind of in your head and be cued into the issues that your patients may have and all of the different types of wounds that we discussed today. I thank you for joining us this afternoon, and I hope you, this was a good review of home care for you, including the different types of wounds and the different types of dressings and standards of care for each form of wound. Thank you.

- [Jessica] Thank you, Dr. Collins. I do see a few more questions. We've got just a couple of minutes left

- [Tracey] Okay.

- [Instructor] If you wouldn't mind addressing some of those.

- [Tracey] Okay. Okay. Now I'm seeing more. They weren't up there. Okay. I answered Angelina. On question seven I thought A would not go over the sacral gauze, films are good over the sacral area, as long as when you're careful, when you're repositioning the patient, because they will keep out the bacteria and you can see in the wound, I hope that answers your question. I'm confused. I thought that you said the deep wound with an infection would be a grade four Wagner. Would you please discuss more fully Charcot foot fractures? A Charcot foot fracture usually occurs when a diabetic patient is... It's a deformity in the forefoot that occurs and the foot fractures. And if it's not offloaded, the Charcot foot will advance itself. So you have to be careful if your patient does have a diabetic foot ulcer that they indeed resume weight bearing very slowly and carefully. And so to not start that deformity in their in their foot, let's see this so looking for the next question. This you just answered on a test and I think that I heard you grade. How would you classify the surgical wound of an incision following a total knee with staples? That would be a surgical wound. That's just a surgical wound. That would be classified as surgical wound.

- [Instructor] Okay. Excellent. Well, thank you so much, Dr. Collins. We appreciate all of this wonderful information. We appreciate you--

- [Tracey] Okay.

- [Instructor] Answering everybody's questions.

- [Instructor] And thank you for everyone--

- [Tracey] Okay.

- [Jessica] Joining us today. We appreciate this. This does conclude today's course. Please join us again for future courses on physicaltherapy.com. Make sure to like our Facebook page and follow us on Twitter for our latest courses. You can also see a list of upcoming live courses on the physicaltherapy.com website. Enjoy the rest of your day, everyone.