



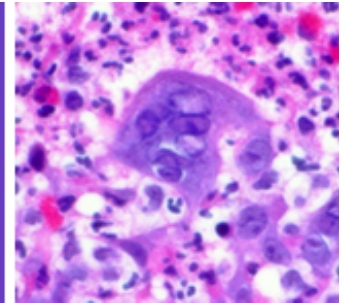
eLITERATURE
REVIEW

eMedicalDermatology Review

Podcast Issue

Presented by the Johns Hopkins University School of Medicine and the Institute for Johns Hopkins Nursing

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VOLUME 3 – ISSUE 4: TRANSCRIPT

Featured Cases: Infantile Hemangiomas: Update on Therapy

After participating in this audio activity, the participant will demonstrate the ability to:

- Describe current controversies in the management of infantile hemangiomas,
- Identify potential side effects of propranolol and prednisolone therapy, and
- Recognize factors that place infants at higher risk for side effects from treatment with propranolol.

This audio activity has been developed for clinicians caring for patients with dermatologic issues related to infantile hemangiomas. You can also read the [companion newsletter](#). In this edition Dr. Puttgen will offer current clinical perspective to the use of propranolol and prednisolone therapy for the treatment of infantile hemangiomas, with the discussion of some typical case scenarios.

Unlabeled/Unapproved Uses

The author has indicated her presentation today will include references to the unlabeled or unapproved uses of propranolol, prednisolone/prednisone in the treatment of infantile hemangioma.

MEET THE AUTHOR



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Faculty Disclosure

Katherine B. Puttgen MD discloses that she has no financial relationship with commercial supporters.

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- **Mark Lebwohl, MD** has disclosed that he has received grants for clinical research from Can-Fite Biopharma and Clinuvel. He also disclosed that he has worked as a consultant for and receiving honorarium from Abgenomics, Allos, Amgen, Astellas, DermaGenoma, DermiPsor, Ethicon, Genentech, GlaxoSmithKline-Stiefel, Glenmark Pharmaceuticals, HelixBioMedix, Janssen Ortho Biotech, LEO Pharmaceuticals, Novartis, Nycomed, Onset Therapeutics, Pfizer, Valeant Pharmaceuticals.

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MR. BOB BUSKER: Welcome to this eMedicalDermatology Review podcast. eMedicalDermatology Review is presented by the Johns Hopkins University School of Medicine and the Institute for Johns Hopkins Nursing. This program is supported by educational grants from Abbott Laboratories, Astellas, Centocor Ortho Biotech Services, Intendis, Valeant Pharmaceuticals, and Warner Chilcott.

Today's program is a companion activity to our December 2011 newsletter topic: Infantile hemangioma: Update on Therapy.

Our guest is Dr. Kate Puttgen, from the Johns Hopkins Departments of Dermatology and Pediatrics. This activity has been developed for dermatologists, nurses, dermasurgeons, dermatopathologists, pediatric dermatologists, immunodermatologists, wound care specialists and allied health care providers caring for patients with dermatologic conditions. There are no fees or prerequisites for this activity.

The Accreditation and Credit Designation Statements can be found at the end of this podcast. For additional information about accreditation, Hopkins policies, and expiration dates and to take the post-test to receive credit online, please go to our website newsletter archive, www.eMedDermReview.org — and click on the January 2012 podcast link.

Learning objectives for this audio program are — that after participating in this activity — the participant will demonstrate the ability to:

- Describe current controversies in the management of infantile hemangiomas,
- Identify potential side effects of propranolol and prednisolone therapy, and
- Recognize factors that place infants at higher risk for side effects from treatment with propranolol.

I'm **BOB BUSKER**, managing editor of eMedicalDermatology Review. On the line we have with us our December newsletter issue's author, Doctor Kate Puttgen, from The Johns Hopkins University School of Medicine in Baltimore, where she's assistant professor of dermatology and pediatrics in the Departments of Dermatology

and Pediatrics. She's also codirector of the Johns Hopkins Vascular Anomalies Group.

Doctor Puttgen has disclosed that he has received grants for clinical research and/or is a consultant to CORIA Laboratories. He has also worked as a consultant for — and received honoraria from — Galderma Laboratories, Ortho Dermatologics, PreCision Dermatology, and has received a grant for research from Medicis Pharmaceutical Corporation.

His presentation today will not include references to unlabeled or unapproved uses of drugs or products, with the exception of new investigations into photodynamic therapies for acne treatment.

Dr. Puttgen — welcome to this eMedicalDermatology Review podcast.

DR. PUTTGEN: Thanks so much, Bob, I'm glad to be here. Thanks for having me.

MR. BUSKER: In your newsletter issue, you reviewed some of the current literature describing treatment options for infantile hemangiomas. Today I'd like to discuss how clinicians can apply these ideas in practice. So please start us out with a case scenario.

DR. PUTTGEN: In case one, we have a seven-week old ex-34 week gestational age girl, who comes into the clinic with a plaque-like bright red infantile hemangioma with superficial and deep components on the left forehead and scalp, extending to the left upper eyelid. The parents tell you it's been growing rapidly over the last five weeks and she is now having difficulty opening her left eye. She is otherwise healthy, though, and her birth weight was 4 pounds, 6 ounces. Her birth history is remarkable for a small ventricular septal defect and maternal history is remarkable for preeclampsia.

The first thing that's important to realize about this case is that we're dealing with a really young infant, and we know hemangiomas tend to double in size in the first two months of life. We also know that they achieve about 80 percent of their maximum size between three and five months of age. So this hemangioma has a lot more growing to do and is likely to be one that will require intervention, because not only is it causing problems today, but untreated it

would likely go on to cause greater problems because of our anticipated knowledge about its future growth.

Early intervention, we think, can prevent a lot of trouble down the line, and it's important to recognize that we can catch these early when possible.

MR. BUSKER: So specifically in the case you presented...

DR. PUTTGEN: It's important to recognize that the baby in this case has a segmental infantile hemangioma on her face. These facial segments have been shown to be reproducible. They don't correspond directly with dermatomes and they don't really seem to correspond directly with Blaschko's lines, which are cleavage lines that occur embryonically. But they are well known at this point and for the face they've been divided into four segments. Segment 1 involves the lateral forehead area, which is what's involved primarily for this infant.

Segment 4 has been referred to as the frontonasal segment, and it goes from the central forehead down over the entire nose into the upper lip. Segment 2 tends to involve the maximal cheek, and segment 3 involves what we used to call the beard segment, the lower third of the face, involving the chin and the lower cheeks and the jaw line.

It's important to recognize this because infants with segmental hemangiomas are at significantly higher risk for complications and are significantly more likely to require treatment. This child is presenting with a hemangioma that definitely needs to be watched closely and is likely to require intervention, compared with, say, a focal hemangioma, which looks like it's arising from a single point. If you saw focal hemangioma in the same location on the forehead as this child, you wouldn't be as worried about the possibility of associated features.

But in this upper facial segment, this segment one and also in segment four, there is concern that these babies are at higher risk for intracranial anomalies, and it's important to take that into account because these babies need a workup that is different from that in a baby who does not have a segmental lesion.

MR. BUSKER: I'm going to ask you to discuss the workup in just a moment, but first talk to us about the risk factors for hemangiomas.

DR. PUTTGEN: We know more about risk factors than we know about pathogenesis of hemangiomas. Some important work done in the last couple of years that delineated that the most significant risk factor in the development of hemangiomas is low birth weight, and this is important for several reasons, not the least of which is that as medical care is improving and we're seeing the survival of more premature, low birth weight infants, we're likely to see a concomitant rise in the number of hemangiomas over time.

Prematurity is also a significant risk factor, but not as significant as low birth weight, per se, though those two often go together. This baby is also a little girl, and we know that hemangiomas are significantly more common in females than males, generally in most studies in a ratio of two to three to one. Pregnancy complications like preeclampsia that's present in this case are also associated with infantile hemangioma.

MR. BUSKER: Now you noted that the location of this hemangioma — on her scalp and extending over the left eye — would require some specific things in the workup. Talk to us about that now if you would.

DR. PUTTGEN: It's important to recognize that this is a segmental facial hemangioma involving segment one, the lateral forehead, and has been shown to be associated with a higher risk of intracranial anomalies as part of what's known as PHACE syndrome, spelled P-H-A-C-E, and this is an acronym well known to dermatologists that stands for posterior fossa malformation, hemangiomas, arterial anomaly, coarctation of the aorta and other cardiac defects, and also eye abnormality. Sometimes people will add and S to this acronym to stand for supraumbilical raphe or sternal clefting.

It is also important that we recognize that because there's a higher risk of intracranial anomalies, we perform some degree of workup to make sure that this baby has a healthy brain. At Hopkins, we tend to favor starting with a transcranial Doppler ultrasound in very young infants, and then we proceed generally to MRI, MRA, if this is abnormal. But if our initial scan is normal and the radiologists here tell us that they have attained good quality images, we'll often defer MRI/MRA of the brain until 6 to 12 months of age.

It is important to note that that's not entirely consistent with every major medical center that

manages these babies. In some places at presentation, regardless of age, some physicians will proceed directly to MRI/MRA, in part because there are very rare reports of stroke occurring in otherwise asymptomatic infants with segmental facial infantile hemangiomas.

The cerebrovascular involvement in PHACE syndrome can be of two different varieties. There can either be static anomalies, such as hypoplasia of major vessels or agenesis of vessels, but there are also reports of progressive stenoses of vessels. There can also be cerebral malformation, the most common of which and the most well known of which is a posterior fossa malformation, which is noted in the acronym for the syndrome.

The next thing to recognize is that because this infant's hemangioma is pressing down on the left eye and the baby is less well able to open the left eye, there is a risk of astigmatism and amblyopia and visual access obstruction.

MR. BUSKER: What are the therapeutic options for this child?

DR. PUTTGEN: This question has a different answer today than it would have had even three or four years ago. Essentially two first line options are available to us at this point in time. The first is oral corticosteroids, which are most commonly given as prednisolone, and a beta blocker known as propranolol.

There has been a huge shift in the last couple of years with prescribing practices for these two medicines. Prior to 2008, oral corticosteroids were really the de facto standard of care, since there are no FDA approved medications for the treatment of infantile hemangioma. Before 2008, corticosteroids were our first line treatment and were generally given in relatively high doses of 2 to 3 mg/kg/day, though some prescribers would give them as high as 5 mg/kg/day.

In June 2008 a letter to the editor was published in the *New England Journal of Medicine*, talking about propranolol as an alternative and relatively safe option for treating infantile hemangiomas. Propranolol was discovered by happenstance, essentially. An infant with a large hemangioma had developed cardiac complications and was given

propranolol to treat those cardiac complications after initially being treated with prednisolone. After a week this infant had significant regression in the hemangioma, so the authors gave propranolol to another infant who likewise had a cardiac complication. Subsequently they reported giving propranolol to nine other infants who had not been given prednisolone, and they noticed similar rapid onset of effect and good tolerability of the medication.

When you think about whether to give a baby propranolol or prednisolone, you should look at the pros and cons of each medicine on a case by case basis. For propranolol the pros are that it appears to be incredibly safe and well tolerated. There is a rapid onset of response, and generally within 24 to 48 hours of giving the medicine we can see that these hemangiomas feel softer to palpation and they often get a somewhat violaceous coloration. And they tend to have a really consistent response.

Obviously not every baby responds, but I would say in the vast majority of infants we treat we see either what we would consider a good or a very good response, and in some cases a truly excellent response.

I have never treated an infant with propranolol who has not at least had stabilization in the growth of the lesion. It also seems to work not only in the early proliferative phase of hemangioma, the first three to five months, it also seems to be effective for infants who are beyond that early proliferative phase, so our age 6, 8, 10, 12 months of age. We have also had good experience getting pretty impressive results in infants who are well beyond a year of age, which is something that really is a remarkable difference when we look at comparing it with prednisolone.

MR. BUSKER: And the other side of using this drug?

DR. PUTTGEN: The cons of propranolol are related to potential side effects that are well known side effects of the drug. We are talking about giving a beta blocking medication to infants who generally have normal blood pressure and normal heart rhythm.

In normal infants we worry about the side effects of decreasing blood pressure, decreasing heart rate, and decreasing blood glucose levels. And there have been case reports of infants having hypoglycemic seizures.

Bronchospasm is also a potential issue. There have been reports of some other less significant side effects like diarrhea and constipation, though those two things are quite common in the population as a whole. There have been a couple of reports of dental caries and some reports of sleep disruption, and there's been one report, to my knowledge, or hyperkalemia.

The other things that go in the con category for propranolol really are less significant, but also important to note. The first is that rebound growth after tapering propranolol is not entirely uncommon. Often that depends on when in the natural history of growth of the hemangioma you try to taper.

The other thing is that most babies require a reasonably long duration of treatment. I usually tell patients on average that six to eight months is pretty typical but we will sometimes need to treat for as long as 10 to 12 months.

MR. BUSKER: And your recommendations about dosing propranolol?

DR. PUTTGEN: I generally advocate, especially in younger infants, treating with a medication three times a day, which can become somewhat onerous, especially when you are giving a medication for a many months as we're talking about.

Some prescribers will give the medication twice a day, but it's important to note when you look at the half life of the drug, it probably does make more sense to give the medication three times a day. Some prescribers will even give it four times a day.

The other thing that's important to note is that because our experience with propranolol is relatively recent, we tend to advocate for inpatient admission for a very young infant. At Hopkins we admit all babies under 12 months of age. Other major medical centers either follow that same protocol of admitting infants under one, some places admit infants under four months of age, some places draw the line at three months, some places at two months, some admit infants where they're only concerned about other potential problems such as PHACE syndrome. So those are the things to keep in mind about propranolol.

MR. BUSKER: Now another treatment option would be prednisolone. How would you compare the two agents?

DR. PUTTGEN: In talking about the pros and cons of prednisolone, the pros for prednisolone are its long track record of safe, dependable use. It's been around for about 40 years at this point. Its side effects are multiple, but they are well known; it's a situation of dealing with the devil you know versus the devil you know less well.

The side effects of prednisolone are generally not life threatening, and that is probably a major difference to draw between propranolol and prednisolone. We seem to run into side effects exceedingly rarely with propranolol, but the possibility for a true, life-threatening side effect with propranolol does exist.

With prednisolone, the side effects appear to be more common, but they are not necessarily life threatening. The side effects of propranolol include irritability and fussiness, which really should not be underestimated when parents are dealing with a young infant whom they'll be giving this medication to often for at least four to six months and as with propranolol, often longer.

Prednisolone can alter sleep, as propranolol can. Infants on prednisolone tend to either get an increase or a decrease in weight gain and they will often alter where they are on their normal growth curve. There is well documented loss of height that occurs when infants are given prednisolone, but it's important to note that most infants will exhibit catch-up growth. So if you look at babies who are given prednisolone, by the time they get to age two, most of them are back on the growth curves that they were on before starting the medication, but there is a temporary loss of height that does occur for a lot of infants who are given this drug.

Prednisolone does increase risk of infection. Some prescribers, when giving prednisolone, will actually give prophylactic Bactrim for concern for PCP pneumonia. We don't do that here at Hopkins, but some folks do. But it's important to talk to families about making sure that the baby is not around folks with runny noses and sore throats, and generally being more aware of keeping their babies away from places where they might be exposed to infection.

A lot of babies, in fact, most will probably develop a cushingoid appearance where they get that larger face and a buffalo hump. They can develop hypertension and hyperglycemia, and there are also effects on bone

growth with prednisolone, but it's unclear what the true significance of this is in infants.

The other really important distinction to draw between prednisolone and propranolol is that prednisolone generally doesn't work well once you get beyond that proliferative phase of growth. That is an important distinction. Propranolol has been shown to work once you get beyond that rapid growth phase. With prednisolone, if we don't catch these babies early we are often unable to get an optimal response.

MR. BUSKER: So based on the information you just presented, for this particular infant, what would be your treatment recommendation?

DR. PUTTGEN: When I meet with families whose baby has an infantile hemangioma that needs treatment, I spend a lot of time talking with the family about the pros and cons of each of these two medications. At this point I would probably offer this infant propranolol as my first-line recommendation, and I would generally recommend, because of the young age, that we start the medication on an inpatient basis. As I said, we currently admit all infants under 12 months unless there are extenuating circumstances that would prevent admission.

Most insurers now cover inpatient admission, though we had to fight for this frequently in the past. Many other medical centers are using propranolol, and many of those centers advocate for admitting young infants, as we do, though in many places they only routinely admit infants who are under two or three months of age, or under six months of age, or those who have concerning clinical findings, such as concern for workups for PHACE syndrome or infants who are presenting in heart failure.

In this situation, though, my primary reason for admitting the baby would be because of her young age, and then as a secondary reason it would be because I'm concerned about ruling out PHACE syndrome in this infant.

The other reason we favor inpatient admission is that it allows us to really closely monitor the early changes in heart rate, blood pressure, and blood glucose up to our target dose of propranolol, which for most infants is 2 mg/kg/day.

On an inpatient basis, we can get to that target dose within 48 hours. At Hopkins we start at 1 mg/kg/day

dosing divided into three doses and then move to 2 mg/kg/day dosing over six doses in the hospital. So babies that are admitted here get six doses over 48 hours.

In comparison, in infants in whom we start propranolol as an outpatient, we typically go more slowly and more cautiously and we reach our target dose over seven to 14 days.

We get a baseline EKG in all infants, whether they're inpatient or outpatient, but we don't routinely obtain echocardiograms or get Holter monitoring, which some centers do.

MR. BUSKER: Thank you, Doctor. We'll return to our eMedicalDermatology Review discussion of infantile hemangiomas in just a moment.

MR. BUSKER: Welcome back to this eMedicalDermatology Review podcast. I'm Bob Busker, managing editor of the program. Our topic is infantile hemangiomas, and our guest is Dr. Kate Puttgen, codirector of the Johns Hopkins Vascular Anomalies Group and Assistant Professor of Dermatology and Pediatrics.

We've been looking at case scenarios to explore how the information Dr. Puttgen reviewed in her newsletter issue can best be applied in the exam room. So if you would, doctor, please describe another patient for us.

DR. PUTTGEN: For case two we'll talk about a three-and-a-half month old girl who presents to the clinic for follow-up with an ulcerated 6 cm focal hemangioma on the lumbosacral spine. Healing has not occurred despite wound care with barrier creams, hydrocolloid wound dressings, and two pulse dye laser sessions. She is very irritable. Diaper changes are becoming progressively more difficult for the patient and the family secondary to the pain from the ulcer.

MR. BUSKER: Background question, Doctor: how common is ulceration?

DR. PUTTGEN: Ulceration is the single most common complication seen in a referral population for infantile hemangiomas. Depending on which study you read, the rate of ulceration ranges between 15% and as high as 25%, and it's often the solitary reason for initiation of therapy.

MR. BUSKER: The current management of this case seems to be following a basic treatment algorithm. Is that correct?

DR. PUTTGEN: Yes. This baby has had what I would consider some good conservative treatment for this ulcer to try to encourage healing and it's found at this point that she is failing conservative management. There are a couple of things that are important to note.

The first thing is that pain control is a really important factor in ulceration to address. A common misconception for parents is that infantile hemangiomas are painful for infants, and that is not true with the notable exception of ulceration, and in the case of ulceration the pain can be very significant for these babies.

The good news is that often just simply providing some barrier protection or a covering over the ulcer is all that is necessary for pain control, but sometimes we will need to resort to oral pain medication, something as simple as Tylenol, or something as aggressive as an oral narcotic.

MR. BUSKER: And the second consideration?

DR. PUTTGEN: In an infant with infantile hemangiomas over the lumbosacral spine, it's important to recognize that these babies do warrant imaging, and the gold standard for imaging is MRI. This baby needs an MRI of the lumbosacral spine to rule out any underlying spinal abnormality.

There is a real limitation for ultrasound in this situation, and that's important to recognize. Generally, we really try to avoid studies that need sedation if possible, but in this situation, ultrasound is generally inadequate to get a good look at the spine, especially in an infant who is over six to eight weeks of age. The size of this hemangioma makes it one that is more concerning for a potential underlying abnormality.

MR. BUSKER: Let's talk about treatment options for this patient. Again, are we choosing between prednisolone and propranolol?

DR. PUTTGEN: Absolutely. It's the same choice again. We need to talk with this family about the risks and

benefits of prednisolone and propranolol. In this situation, I would probably tend to favor propranolol, as there is good evidence now that it helps to heal ulcers relatively quickly.

In the paper that we talked about in the newsletter by Sans, et al, from the French group, that initially described the use of propranolol, they report healing time for ulcers of less than two months. In my experience the healing of the ulcers typically occurs quite a bit more quickly than that. For most infants, except those with the deepest of ulcers, this usually will happen within two to four weeks.

I have had cases where the ulcerations have been so stubborn that after addition of propranolol, if there still has not been healing within, say, one to two months, I will sometimes add a short course of prednisolone to the propranolol to try to get the ulcer to heal, and then try to taper the prednisolone relatively quickly; but it should be noted this is really required in a minority of cases.

It is also important to note that in tapering prednisolone when using it in combination with propranolol, you need to be especially careful about monitoring for hypoglycemia.

MR. BUSKER: Thank you, Doctor. I think we have time for one more case.

DR. PUTTGEN: This patient is a four-month-old girl who presents to the clinic with a 2 cm mixed focal infantile hemangioma on the right mid-cheek. She has no associated symptom and is otherwise healthy. The parents are very concerned about the appearance and want to know if you can laser it off.

MR. BUSKER: All right. So these parents are concerned basically that their child is "disfigured" — and I'm going to put that word in quotes — and I'm going to ask you, define disfigurement for us, if you would.

DR. PUTTGEN: I think this is a really important concept, and this is something that I struggle with in managing patients on a daily basis because the definition of disfigurement is something that is fluid in some sense.

We do know from natural history data about hemangiomas that more than half, after they have

fully involuted, are going to leave behind some sort of residual scar tissue, fibrofatty tissue, telangiectasias, and basically just a texture that is abnormal and appears aesthetically not normal.

And so if you know that you can give a medication and shrink this hemangioma and prevent this child from having a disfiguring scar on their face, which could adversely affect the psychosocial development as a young child, then it behooves you to have a candid conversation with the family about what you can expect from expectant management of this lesion versus intervention with treatment.

A lot of times I will intervene in a situation like this in my mind thinking that by initiating medication I can obviate the need for future surgery, because without treatment, the likelihood is at least 50% that this baby may need to have at least one, if not more, plastic surgery interventions, which of course require general anesthesia and don't come without potential morbidity themselves.

I will talk with the family and I'll often get a sense of how bothered they are by the lesion, and I'll also obviously take into account my clinical judgment about whether I think this lesion is likely to regress on its own and not leave behind any significant deformity, or whether I think the likelihood of deformity is reasonably high and that intervention could prevent future deformity.

MR. BUSKER: You noted in the case presentation, that the parents have asked if you can "laser it off." How should a clinician respond to that question?

DR. PUTTGEN: This is an area that still has quite a bit of controversy even among experts who treat hemangiomas. But it would be safe to say that the vast majority of providers who treat patients with infantile hemangiomas and vascular anomalies understand at this point that there is no real role for pulse-dye laser or any type of laser treatment in the early proliferative phase of hemangiomas. A lot of this is centered around the limitations of the laser technology itself.

Pulse-dye laser can penetrate only about 2 mm into the skin at a maximum, and the vast majority of hemangiomas are significantly deeper than that. And when you look at babies who have had pulse-dye laser in the first year of life versus those who don't, the main differences at a year are that the babies who

have had laser have a higher risk of scarring, and in my mind it doesn't justify the use of a laser because you are really not giving these babies a better aesthetic outcome and you are in no way altering the natural history of growth of the hemangioma by using the laser. The hemangioma is going to grow regardless of whether or not laser is used.

MR. BUSKER: Your treatment recommendation for this patient, Doctor.

DR. PUTTGEN: This is a really important point, I think, because as our treatment algorithm is changing with the introduction of propranolol as a treatment option, we are now offering medication to infants whom we never would have offered medication to in the past. By that I mean that in the past we really reserved the use of prednisolone for infants who had truly life-threatening or truly-function threatening lesions because when we weighed the risks and benefits of giving prednisolone, we reserved it for babies in whom we felt that not treating would be eminently harmful to them.

Because we feel that propranolol is both an efficacious and also a relatively safer option, we do tend to offer treatment to babies like this one who have the potential for future disfigurement that could be prevented by initiating a medication. So this is not a baby that I would discuss with the family the option of prednisolone as a serious consideration because I think that if we were going to initiate a medication, it would be propranolol.

But then the next phase of that discussion with the family is about the importance of giving the propranolol over a long period of time, and if we do decide to intervene, this will not necessarily be a quick fix and that most infants will require the medication for six months, and in many cases longer. In the paper by Sans, et al, the average duration of treatment for the babies who had completed medication at the time of the publication was 9.4 months on average.

The other thing that's important to talk about with families is the possibility of rebound growth with the propranolol, and because of that possibility, if we taper the medicine too early we will often rationalize a longer treatment course, often getting babies close to a year of age before we start the taper.

MR. BUSKER: Thank you for those interesting cases, Doctor. I'd like you to take the last word now on infantile hemangiomas — what would you like to see happen in the near future?

DR. PUTTGEN: I think the first thing that has to happen in the immediate future is head-to-head trials comparing propranolol with prednisolone, because we're really looking at two de facto standards of care. And at this point it's really incumbent on the clinician to decide which of these medications is best for the patient. Until we have randomized trial data to direct us, we're taking the treatment of these infants on a case-by-case basis.

The next thing that I think is really important for us to investigate in the field is that we have no clear idea of what the mechanism of action of propranolol, or, for that matter, prednisolone is, in the treatment of hemangiomas. So we have a lot of really well thought out proposed mechanisms of action, but we don't have any clear understanding of the true mechanism of action in treating these hemangiomas.

We also need more information about the pathogenesis of hemangiomas as a whole, and I think once we have a better understanding of the pathogenesis we will be able to provide much more rational suggestions for therapy for these babies that do need treatment.

MR. BUSKER: Dr. Kate Puttgen from the Department of Dermatology and Pediatrics at Johns Hopkins — thank you for being part of this eMedicalDermatology Review Podcast.

DR. PUTTGEN: Thank you so much, I really enjoyed it.

MR. BUSKER: This Podcast is presented in conjunction with eMedicalDermatology Review, a peer-reviewed CME and CNE -accredited literature review e-mailed monthly to clinicians treating dermatologic patients.

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