Foot Care: Screening and Detection

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Alaska Native Medical Center
Outline

• The Problem (or is it an opportunity?)
• Doing a Quick Foot Exam
• Assigning Risk Categories
• Ideas and observations along the way
Diabetic patients in the USA (2015):

9.4% of people = 30.3 million people
Amputations in the USA

• 96,000 per year
• Primary cause is diabetes
  • 75% are preventable

• 3 out of 4 are preventable!!!
Poor control of:
Blood Glucose
Blood Pressure
Lipids

Peripheral Vascular Disease (PVD)

Neuropathy
Poor Circulation

- Decreased healing
- Increased risk of infection
Neuropathy

- Sensory (Loss of Sensation)
- Motor (Impaired Control and Foot Deformities)
- Autonomic (Loss of Sweat and Oil)
Are amputations related more to poor sensation or circulation?

- + Sensation
  - - Blood Flow

If it hurts, they will seek help

- - Sensation
  - +/- Blood Flow

If there is no pain, there is no motivation to seek help
Risk Factors for Foot Ulcers

• Poor Glycemic Control
• Peripheral Vascular Disease
• Peripheral Neuropathy
• Deformity
• Previous Ulcer or Amputation
• Tobacco Use
• Visual Impairment
How can we help people prevent amputations?

• Find the high risk people
  (Annual Foot Exams and regular foot checks)

• Help people take care of their feet
  (simple interventions save lives)
10-20% of patients coming to see you for a routine office visit will have:

- Calluses
- Bacterial/Fungal Infections
- Problematic Nails
- Ulcers
THE FOOT EXAM
First, examine inside and outside the shoes. They often can tell a much bigger story...
The Foot Exam looks at FOUR main areas:

• 1) Skin, Nails, Calluses

• 2) Circulation

• 3) Muscles and Deformities

• 4) Sensation
1) SKIN
Dry
Thin
Brittle
Moist

Tinea Pedis (or athlete’s foot)
Check in between toes
Poor Hygiene and Buildup of old skin
“Dermopathy” describes various skin conditions
Your patient tells you, “My pants are catching on my heel, I think maybe the skin is a little rough back there.”

Debridement revealed intact skin beneath.
A little bit of lotion can make a BIG difference!
And allowing the patient to see the before and after photo on
his smart phone made a big impression.
Foot cream for everyone!
1) NAILS
Abnormal Shapes
One foot with many types of nails
Mycotic or Fungal nails
This patient removed his own ingrown nail before the provider could get there. Good initiative, but not recommended! He ended up doing well.
With practice, simple nail nippers can be used to handle a variety of nail types.
1) CALLUSES
Commonly form over bony prominences like the Metatarsal Heads
Also common on the tips of clawed toes
Heel Calluses with deep cracks
PoroKeratoma
(a callus that grows in a sweat gland)
There are many callus tools available, but choose the one appropriate to each type of callus and the skill level of the care giver.
2) CIRCULATION
Pulses

• Dorsalis Pedis

• Posterior Tibial
Capillary Refill Time
(usually less than 2 seconds)

Hair on the toes

(Extra credit for identifying these feet!)
Edema

Choose the right sock for the patient and the climate.

There is no ONE right sock for everyone.
3) MUSCLES
Extrinsic Muscles
Intrinsic Muscles support the normal shape of the foot

The extensor digitorum brevis (EDB) can be easily palpated just in front of the lateral ankle bone when the toes wiggle.

An Intrinsic Minus Foot leads to deformities
3) DEFORMITIES
Yes, we need to look at both feet! No two are alike.

Various types of bunions
Overlapping hallux valgus and clawing of lesser toes
Pes Cavus (high arch) with Hallux Limitus (stiff toe)
Charcot or Rocker Bottom Foot Deformity

- Profound sensory and proprioceptive neuropathy
- Preserved circulation (hyperemia)
Midfoot bony collapse leads to the classic rocker bottom deformity.
Helpful things for your clinic:

- Dual density insoles
- Longitudinal arch supports
More helpful things....

Metatarsal pads

Silicone toe pads (not for those with reduced circulation!)
4) SENSATION
Determine the presence or absence of Protective Sensation with the 10 gram (or 5.07) monofilament

10 test sites each foot

Apply the filament perpendicular to the skin
Be aware, there can be other causes and patterns for absence of protective sensation, such as:

- lumbar pathology
- trauma to peripheral nerves

It is important to record either “present” (+) or “absent” (-), but not “decreased”
Deformity + Neuropathy + Pressure = ULCER
ASSIGNING FOOT RISK CATEGORIES
Foot Risk Categories

- **Risk Category Zero**
  (protective sensation is intact)

- **Risk Category One**
  (loss of protective sensation or decreased circulation, *no* deformity)

- **Risk Category Two**
  (loss of protective sensation or decreased circulation *with* deformity)

- **Risk Category Three**
  (history of or current ulcer)
# Statewide foot exam findings in Alaska

<table>
<thead>
<tr>
<th>Skin</th>
<th>Nails</th>
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</thead>
<tbody>
<tr>
<td>- dry 50%</td>
<td>- problematic 30%</td>
</tr>
<tr>
<td>- poor hygiene 25%</td>
<td></td>
</tr>
<tr>
<td>- tinea pedis 10%</td>
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</table>

<table>
<thead>
<tr>
<th>Calluses</th>
<th>Deformities</th>
</tr>
</thead>
<tbody>
<tr>
<td>- problematic 30%</td>
<td>- pes planus 50%</td>
</tr>
<tr>
<td></td>
<td>- bunions/hallux limitus 25%</td>
</tr>
<tr>
<td></td>
<td>- claw toes 10%</td>
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</tbody>
</table>
You’ve done an exam, you’ve determined a Risk Category, now what?
Risk Category **Zero**: repeat foot exams *annually*

Risk Category **One**: recheck feet *every 6 months*

Risk Category **Two**: recheck feet *every 3 months*

Risk Category **Three**: recheck feet *every month*
Every patient should receive PATIENT EDUCATION, ...BUT... customize this to each individual.
“Check your feet every day or have someone help you”

Problems:
Self-conscious
“Don’t want to bother other people”
“Family doesn’t help me”
“Can’t see good”
“Back or knee or hip is too stiff”
“Hands don’t work good”
“I’m too fat to reach them”
“Wash and dry your feet every day, including between your toes.”

Common problems:
People soak their feet too long
Warm water may not be easy to get
Steam baths instead of tubs or showers
“Trim your toenails straight across.”

All of the previous problems, plus:
Deformed or difficult toenails
People use different tools
(knives, box cutters, scissors, wire cutters, pliers, Dremel sanders)
So, if 3 out of 4 amputations are preventable, what do we do?
“It’s not rocket science. Wash your feet. Cut your nails. Keep the skin supple. Wear appropriate shoes and socks.”

Karl Boesenberg, DPM
ANMC
What a good pair of nail nippers can do...

BEFORE

AFTER
Does every diabetic patient need special diabetic shoes?
If someone has protective sensation and no deformity, they can wear whatever shoe they want.

Lack of protective sensation and deformity require protective shoes.
Alaskan footwear is often fine for most people.
Different foot shapes need different shoe shapes (also called “shoe lasts”)  

Sometimes showing someone a picture can be worth 1000 words
Shoes need to fit each foot. Check and see: are they long, wide and deep enough?....

Toe deformities may require extra depth
Examples of extra-depth footwear
“By preventing calluses, you will prevent most of the amputations.”
Charles Edwards, DPM
ANMC
Calluses under the great toe are common and should be taken very seriously. They are a frequent factor in amputations.
What a scalpel can do…
When your patient tells you, “I just went to Anchorage to make a Costco run.”

Carefully removing the callus shows what’s really going on beneath
Immediate intervention is critical. Photos are taken one and two days later. A post-op shoe with a cut out insole was used and the patient was asked to not walk too much.

There is already a thin layer of epithelium!
...the foot is still healed one year later...
Hurray!

Remember what it first looked like?
Another example of how effective simple callus removal can be...

One year later
The biggest obstacle to foot care I hear all over the state of Alaska:

“But I don’t have any special training to cut toenails.”

Don’t tell that to this 11 year old boy. He’s been cutting his grandma’s toenails for 2 years.
2012-2016 Chart Review of 68 amputations: some observations...
What causes amputation more often? Neuropathy or PVD?

<table>
<thead>
<tr>
<th></th>
<th>Neuropathy only</th>
<th>PVD only</th>
<th>Both</th>
<th>Neither</th>
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<tbody>
<tr>
<td>AKA (5)</td>
<td>0</td>
<td>4</td>
<td>0</td>
<td>1</td>
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<tr>
<td>BKA (20)</td>
<td>9</td>
<td>3</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>Toe/Partial Foot (27)</td>
<td>14</td>
<td>2</td>
<td>8</td>
<td>3</td>
</tr>
<tr>
<td>Totals (52)</td>
<td>23</td>
<td>9</td>
<td>14</td>
<td>6</td>
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## Mechanism of injury

<table>
<thead>
<tr>
<th></th>
<th>Callus</th>
<th>Nails</th>
<th>Ischemia</th>
<th>Trauma</th>
<th>Infection</th>
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<td>5</td>
<td>0</td>
<td>1 (TKA)</td>
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<tr>
<td>BKA (17)</td>
<td>12</td>
<td>0</td>
<td>1</td>
<td>4</td>
<td>1 (ORIF)</td>
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<tr>
<td>Toe/Partial</td>
<td>8</td>
<td>2</td>
<td>4</td>
<td>13</td>
<td>0</td>
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<tr>
<td>Foot (27)</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>20</td>
<td>3</td>
<td>10</td>
<td>17</td>
<td>2</td>
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</table>
What could have made a difference?

<table>
<thead>
<tr>
<th></th>
<th>Callus Care</th>
<th>Nail Care</th>
<th>Foot Checks</th>
<th>Footwear</th>
<th>Insoles</th>
<th>Vascular Surgery?</th>
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</thead>
<tbody>
<tr>
<td>AKA (5)</td>
<td>0</td>
<td>1</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>BKA (20)</td>
<td>12</td>
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<td>15</td>
<td>3</td>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td>Toe/Partial</td>
<td>8</td>
<td>2</td>
<td>22</td>
<td>3</td>
<td>7</td>
<td>3</td>
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<tr>
<td>Foot (27)</td>
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<td></td>
<td></td>
</tr>
<tr>
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<td>3</td>
<td>40</td>
<td>6</td>
<td>17</td>
<td>8</td>
</tr>
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</table>
Nobody made a greater mistake than he who did nothing because he could only do a little.

Edmund Burke
LITTLE things make a BIG difference!