Health care

- Patients with chronic disease ↑
- Health care professionals ↓
- Costs ↑

Self management

Involving patients into the management of their disease

• Clinical control ↑
• Autonomy ↑
• Adherence ↑

Clinical results ↑
Quality of Life ↑

• Healthcare utilization ↓ (Costs ↓)
Self management

Lifestyle
- Low salt
- Exercise

Monitoring
- Blood pressure
- Glucose

More leading (directing) role

Supporting role

(geëldertelijke) Regie rol

Coachende rol

Lifestyle
- Low salt
- Exercise

Monitoring
- Blood pressure
- Glucose

More leading (directing) role

Supporting role
Disease / Self management

- Medical Devices
- Self-Management
- Personal Health Record
- Patient

Nephrology
Disease / Self management

Care Provider

Electronic Health Record

Results

Self-Management

Medical Devices

Patient

Feedback / Support

Personal Health Record

Nephrology
Disease / Self management

Care Provider

Electronic Health Record

Results

Personal Health Record

Patient

Feedback / Support

Information Education Skills

Medical Devices

Self-Management

Content | Technical | Organizational | Financial | Social | Scientific

Boundary Conditions

Nephrology
Need for new medical devices

Renal transplant patients
First year: 20 visits of outpatient clinic

Most important aspects to be measured:
• Creatinine (renal function)
• Blood pressure

Need for handheld device for measuring creatinine at home
Point-of-Care Creatinine analyzer
Nova StatSensor®
Analytical validation

Critical difference / Reference Change Values (RCVs):
• 35% for StatSensor in fingerprick
• 23% for Statsensor in heparinized venous whole blood,
• 15.5% for the central lab method

RCVs were calculated as $2.8 \times (CV_a^2 + CV_b^2)^{1/2}$.
CV$_a$ = analytical CV; CV$_b$ = intraindividual biological CV.
Statsensor: stable kidney-pancreas tx patients
Statsensor: kidney patients direct after Tx
First weeks after transplantation:
- Creatinine Out-patiënt-clinic: 1 x / week
- Creatinine Homemeasurements (Statsensor): 7 x / week
Conclusion

Device
• High RCV (2.25 increase compared to central lab method)
=> for clinical use central laboratory method can not be replaced by the Statsensor

Performance of measurement
• inter-individual variation

Use in clinical setting
• More measurements (7x)
• Identifiable trends (necessary for detection of rejection)
feasibility - study

Renal Transplant patients:
• 1\textsuperscript{rd} year 20 times visit outpatient clinic

Most important measurements:
• Creatinine (renal function)
• Blood pressure

Aim:
Home-measurements of creatinine:
• Detection of trends/rejection?
• Experiences of patients and healthcare professionals
Algorithm based on last measurements
- Deviation from mean (number of individual standard deviations)

If creatinine to high
- Once => repeat measurement
- Twice => contact the hospital
Welcome to mijnnierinzicht

Is your kidneyfunction declining? In that case it is important to do everything in order to prevent or slow down this kidneyfunction decline... With sensible nutrition, sufficient exercises, quit smoking...
Do not wait, but anticipate, for your own health!

Mijnnierinzicht.nl will help you!
Mijnnierinzicht.nl has been developed as support for several self-management projects, for the benefit of kidney patients. The Dutch Kidney Foundation makes it possible for kidney patients to use this tool for free! Take your advantage with this offer! More information.

Login on my page

Your settings

Username

Password

Save password

Login

I don't have an account >
I've lost my password >
I've lost my activationcode >
Activate my account >

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De kreatininemeter

De kreatininemeter is handzaam en eenvoudig te gebruiken.

Beweeg de muis over de verschillende cijfers op het scherm.

Afbeelding bloeddruppel op scherm

Als je een strip in de meter schuift, verschijnt er een druppel op het scherm. Dit betekent dat de meter klaar is voor een meting met een druppel bloed.
Instructievideo kreatinine meten

Plaats een nieuwe teststrip in de meter. De goudkleurige kant moet in de meter.
### Dagboek invullen

**1 juni 2012**

#### Basis

<table>
<thead>
<tr>
<th>voedingswaarde</th>
<th>commentaar</th>
</tr>
</thead>
</table>

**Bloed**

<table>
<thead>
<tr>
<th>Kreatinine (µmol/l)</th>
<th>185</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kreatinine2 (µmol/l)</td>
<td></td>
</tr>
</tbody>
</table>

**Urine**

**Opstaan**

Toon rapportage
Feedback to the patient

Result is outside the expected range
Repeat the measurement

Creatinin (μmol/l)

Date

Close
Results visible in Medical Record Hospital

Web-application of patient

Integration in medical record
Results feasibility study

4 patients with rejection:
Detectable by both central lab and point of care measurements

Admittance for rejection
Experiences of doctors

Feasibility study:
• Variable support: Less accuracy of Statsensor compared to central lab method

Common barriers (literature):
• Change of directive to coaching role
• Vagueness concerning responsibilities
• Fear for loosing control concerning the treatment
• Fear for extra workload (time / administrative)
• Uncertainty concerning the advantages of selfmanagement
Experiences of patients
Experiences of patients

General satisfaction:

![Bar chart with satisfaction levels from very bad to very good]

Main advantages:

- Up to date information concerning the actual renal function
- Quick detection of changes in renal function
- Outpatients visits less stressful
- Better coping with renal disease: more confidence / certainty
- Positive towards reduction of outpatient clinic visits
Conclusion

Point of care-devices:
• New opportunities for Self management

Point of Care Creatinine device (Statsensor)
• Improvement is necessary

Combined with frequent measurements and use of algorithms even less accurate devices can be used for home-monitoring
Analytical validation

Average error index \( \frac{(Y-X)}{TE_a} \): -0.96 (range: -6.61- +5.42).

Difference between two methods: within the \( TE_a \) in 39.5% of the samples

\( (TE_a = 6.9\%; \ C. \ Ricos \ et \ al. \ Scand.J.Clin.Lab.Invest \ 1999;59:491-500) \)

Data of participant of feasibility study

![Graph showing data of kreatinine levels over time for Lab and Statsensor](image-url)