We studied 45 patients in this study. It is reported that BFI correlated the cortical blood flow. BFI may be more sensitive than TOI.

Patient's characteristics are shown in Table 1. Kuebler during clamping regional cerebral flow during the operation. By using the BFI derived from NIRS, it is possible to measure the change. During cross clamping, BFI did not show significant change during the surgery. From 0.087 ± 0.045 μmol/L/s to the level of pre carotid cross clamping. Diseased side significantly decreased during carotid cross clamping compared to the level of pre carotid cross clamping and after unclamping. BFI of healthy side did not show significant change during carotid cross clamping. TOI did not change significantly during carotid cross clamping.

We studied 45 patients (43 male, 2 female; aged 71 ± 6.7). Figure depicted BFI of diseased side significantly decreased during carotid cross clamping compared to the level of pre carotid cross clamping. From 0.14 ± 0.15 μmol/L/s to 0.064 ± 0.062 μmol/L/s. BFI of healthy did not show significant change during the surgery. Pre carotid cross clamping: 0.12 ± 0.069 μmol/L/s; during clamping: 0.11 ± 0.064 μmol/L/s; after unclamping: 0.15 ± 0.15 μmol/L/s (p = 0.30). We maintained significantly high blood pressure during carotid cross clamping, systolic pressure pre clamping: 126 ± 21 mmHg, during cross clamping 164 ± 16 mmHg, after unclamping 112 ± 16 mmHg.

Conclusion
BFI as regional cerebral blood flow of the diseased side significantly decreased during clamping the common carotid artery, even if high blood pressure was maintained. However, BFI of the healthy side did not show the significant change. By using the BFI derived from NIRS, it is possible to measure the regional cerebral flow during the operation.

Introduction
Evaluation of CBF during CEA is very crucial. However, it is difficult to measure CBF in the operating room. Recently, near infrared spectroscopy (NIRS) with high accuracy has developed which enables to measure regional cerebral blood flow by injection of indocyanine green. Kubler et al. reported that regional cerebral blood flow derived from NIRS correlated well with values assessed by radioactive microspheres in pigs. We have demonstrated preliminary data that BFI as regional cerebral blood flow of the diseased side significantly decreased during clamping the common carotid artery in American Society of Anesthesiologists Annual Meeting 2013. We analyzed the change of the cerebral blood flow by clamping the carotid artery in carotid endarterectomy with an increased number of cases.

After approval of institutional ethical board, patients undergoing elective carotid endarterectomy were enrolled in this study. After induction of general anesthesia, NIRS sensor was placed bilaterally 1cm above eyebrow on the scalp. The dye indocyanine green (0.5 mg/kg) was injected in the following time:

1. Pre carotid cross clamping
2. During carotid cross clamping
3. After carotid unclamping

Materials: The kinetics of an intravenous bolus of ICG was monitored by NIRO 200NX (Hamamatsu Photonics, Hamamatsu, Japan).

Methods
Subjects: Patients undergoing elective CEA
Methods: After induction of general anesthesia, NIRS sensor was placed bilaterally 1cm above eyebrow on the scalp. The dye ICG (0.5 mg/kg) was injected in the following time:

1. Pre carotid cross clamping
2. During carotid cross clamping
3. After carotid unclamping

Materials: The kinetics of an intravenous bolus of ICG was monitored by NIRO 200NX (Hamamatsu Photonics, Hamamatsu, Japan).

Results
BFI of healthy did not show significant change during the surgery. From 0.087 ± 0.045 μmol/L/s to the level of pre carotid cross clamping. Diseased side significantly decreased during carotid cross clamping compared to the level of pre carotid cross clamping and after unclamping. BFI of healthy side did not show significant change during carotid cross clamping. TOI did not change significantly during carotid cross clamping.

Discussion
BFI decreased significantly during carotid cross clamping, even if higher BP was maintained during carotid cross clamping and TOI remained unchanged. BFI may be more sensitive than TOI. It is reported that BFI correlated the cortical blood flow. (1) Hence, the result of this study is valid.

Methods
Subjects: Patients undergoing elective CEA
Methods: After induction of general anesthesia, NIRS sensor was placed bilaterally 1cm above eyebrow on the scalp. The dye ICG (0.5 mg/kg) was injected in the following time:

1. Pre carotid cross clamping
2. During carotid cross clamping
3. After carotid unclamping

Materials: The kinetics of an intravenous bolus of ICG was monitored by NIRO 200NX (Hamamatsu Photonics, Hamamatsu, Japan).

Results
BFI of healthy did not show significant change during the surgery. From 0.087 ± 0.045 μmol/L/s to the level of pre carotid cross clamping. Diseased side significantly decreased during carotid cross clamping compared to the level of pre carotid cross clamping and after unclamping. BFI of healthy side did not show significant change during carotid cross clamping. TOI did not change significantly during carotid cross clamping.

Discussion
BFI decreased significantly during carotid cross clamping, even if higher BP was maintained during carotid cross clamping and TOI remained unchanged. BFI may be more sensitive than TOI. It is reported that BFI correlated the cortical blood flow. (1) Hence, the result of this study is valid.

Methods
Subjects: Patients undergoing elective CEA
Methods: After induction of general anesthesia, NIRS sensor was placed bilaterally 1cm above eyebrow on the scalp. The dye ICG (0.5 mg/kg) was injected in the following time:

1. Pre carotid cross clamping
2. During carotid cross clamping
3. After carotid unclamping

Materials: The kinetics of an intravenous bolus of ICG was monitored by NIRO 200NX (Hamamatsu Photonics, Hamamatsu, Japan).

Results
BFI of healthy did not show significant change during the surgery. From 0.087 ± 0.045 μmol/L/s to the level of pre carotid cross clamping. Diseased side significantly decreased during carotid cross clamping compared to the level of pre carotid cross clamping and after unclamping. BFI of healthy side did not show significant change during carotid cross clamping. TOI did not change significantly during carotid cross clamping.

Discussion
BFI decreased significantly during carotid cross clamping, even if higher BP was maintained during carotid cross clamping and TOI remained unchanged. BFI may be more sensitive than TOI. It is reported that BFI correlated the cortical blood flow. (1) Hence, the result of this study is valid.

Reference