第20回日本医療情報学会春季学術大会
COI開示

演題名： MFERの現在・過去。未来

筆頭演者名： 平井 正明

私が発表する今回の演題について開示すべきCOIはありません。

NIHON KOHDEN

Fighting Disease with Electronics

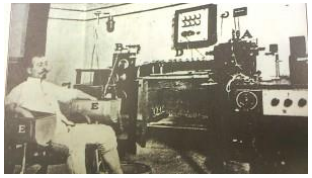
MFERの現在･過去･未来

ISO/TC 215

平井正明

2016年6月3日

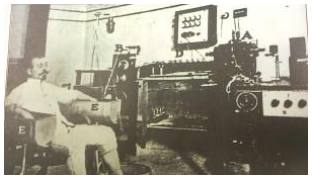
1900 1950 1970 1990 2000 2010・・・

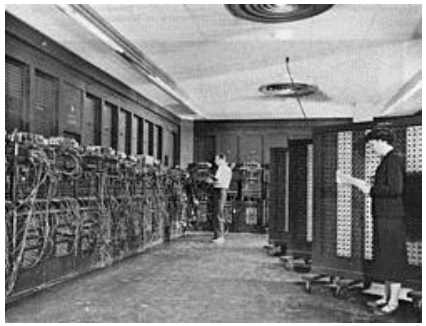


1903年 アイントーヘン 心電図

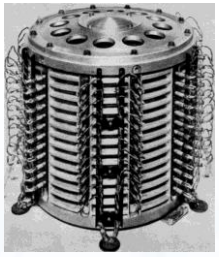
NIHON KOHDEN

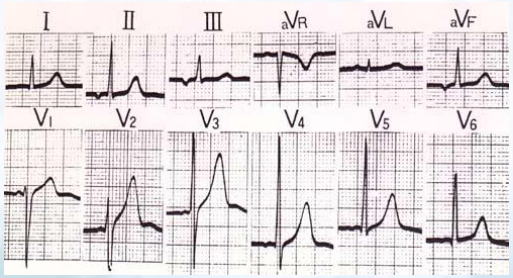
1900 1950 1970 1990 2000 2010・・・





1932年 磁気ドラム
1946年 ENIAC





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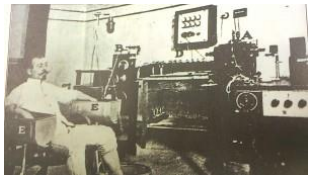
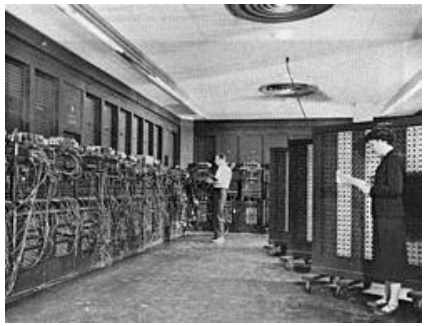
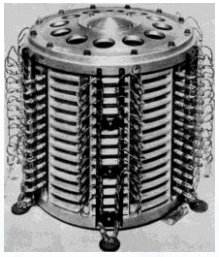
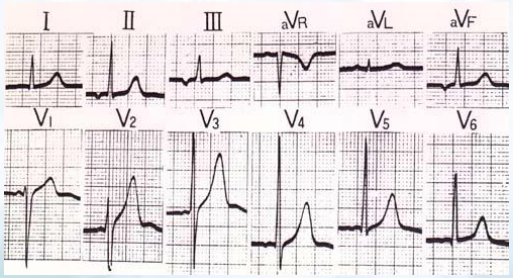
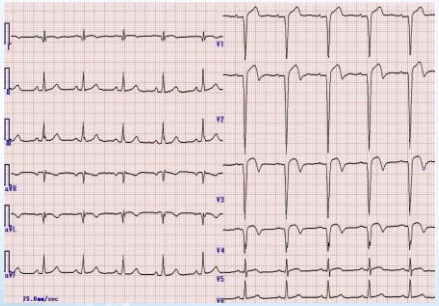






1969年 フロッピーディスク





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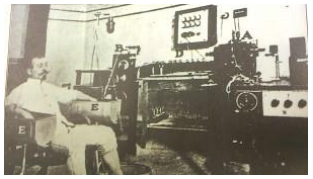
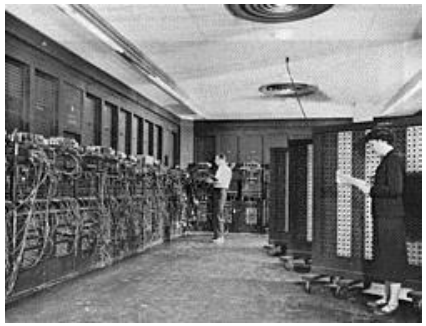
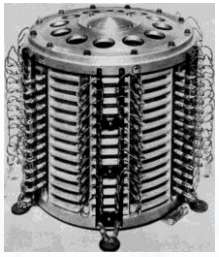
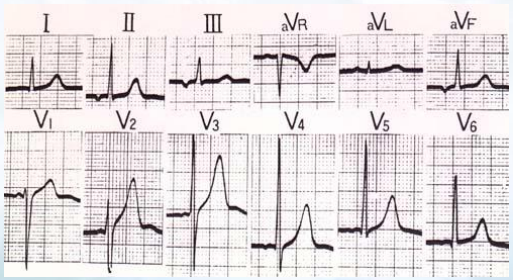
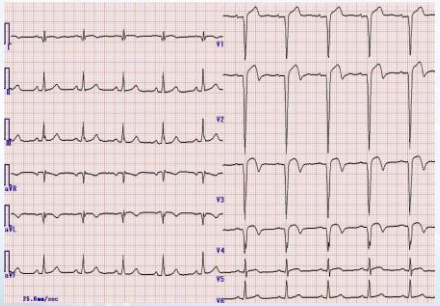




1976年 VAX







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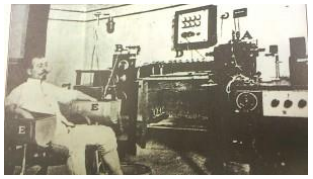
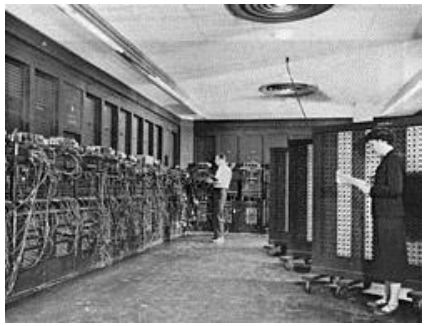
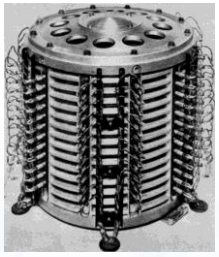
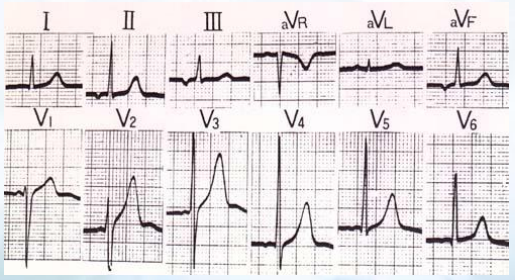
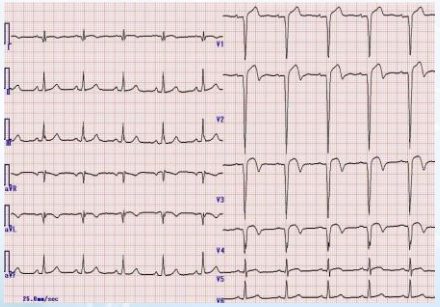




1976年 VAX
1977年 Apple







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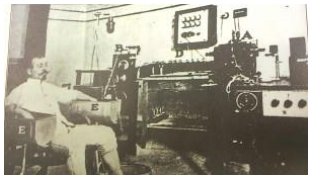
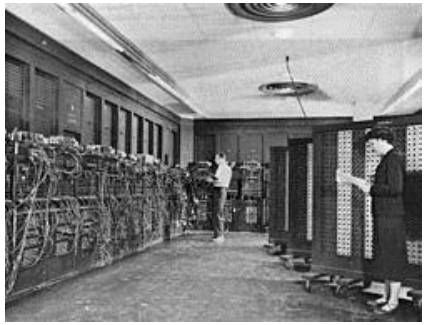
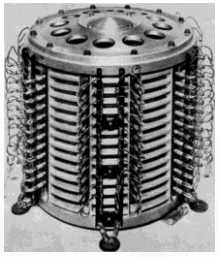
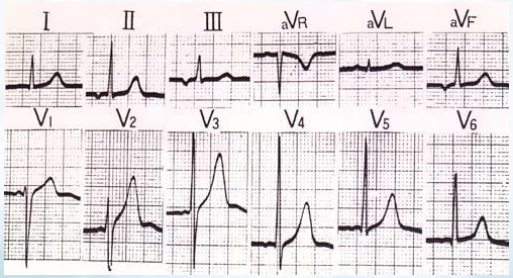
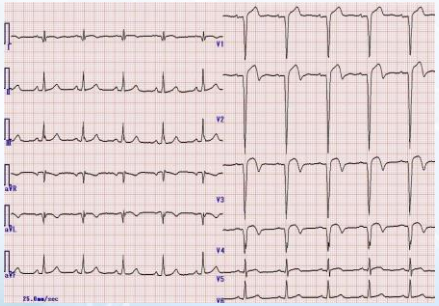




1990年 EDF
1993年 SCP-ECG
2000年 DICOM waveform
IEEE/FEF







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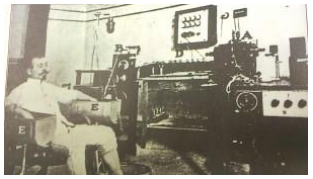

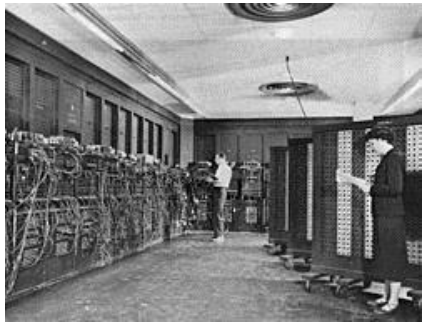

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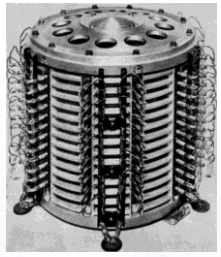
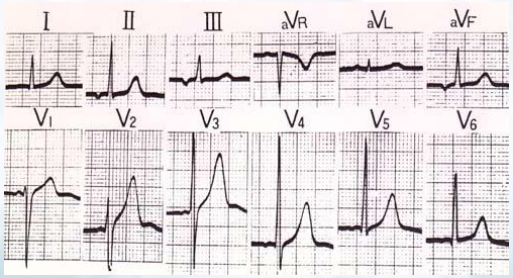
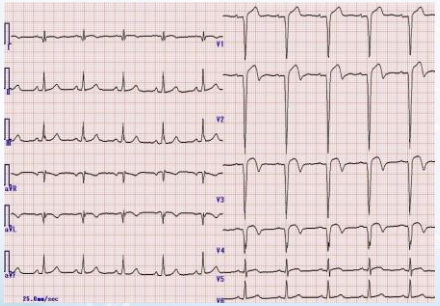


- 心電学会・循環器学会
- メーカ技術者
- 医療情報
- 電子カルテメーカ
- 行政





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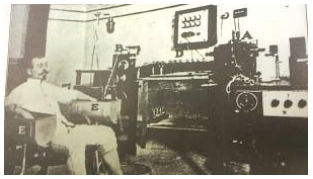
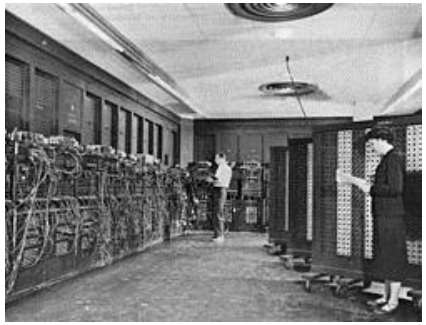




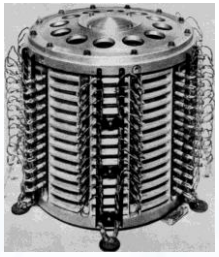
1995年

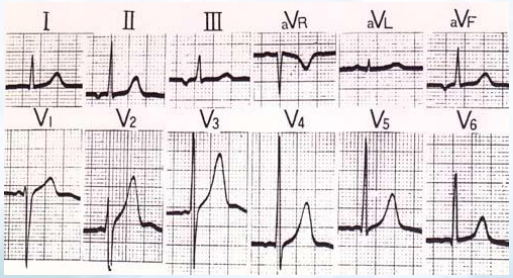
WTO/TBT

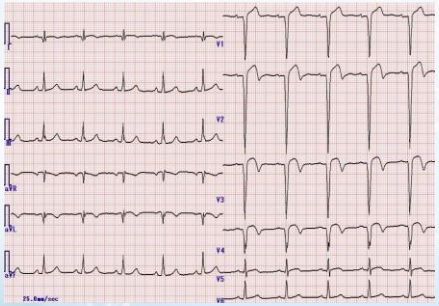
ISO

CEN: ウイーン協定
CENELEC: ドレスデン協定

HL7/IEEE → ISO







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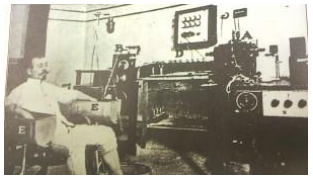
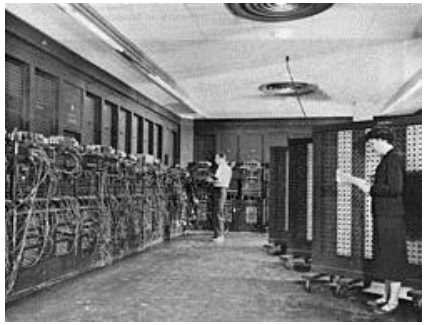
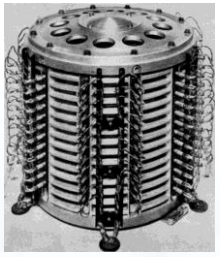
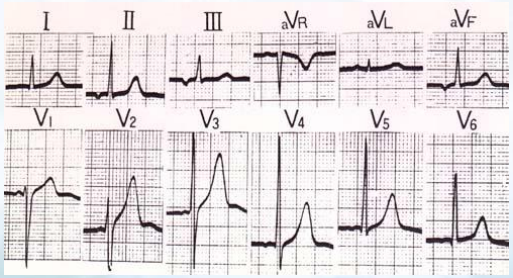
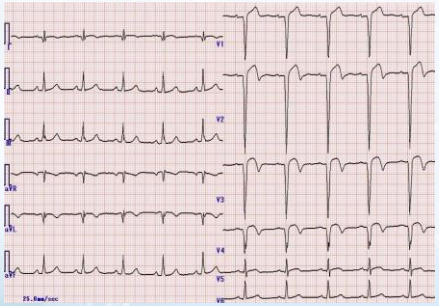






2001年 MFER
使われる標準
普及活動
メーカへの働きかけ





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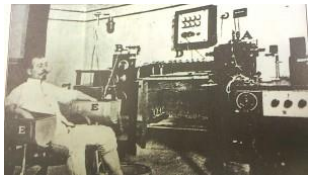
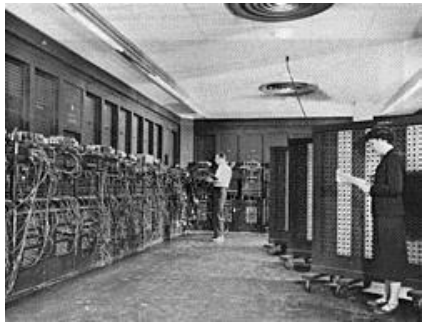
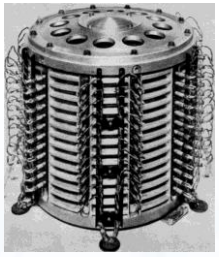


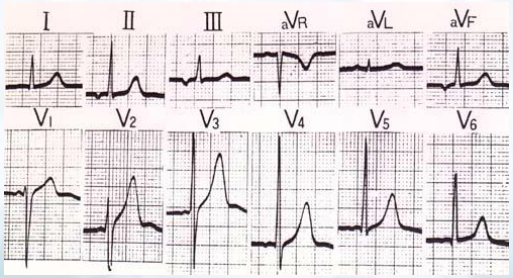


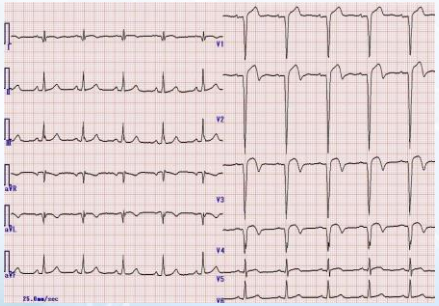
Medical waveform Format Encoding Rules



Waveform JWG

- MFER
- ISO
- CEN
- HL7
- IEEE
- DICOM





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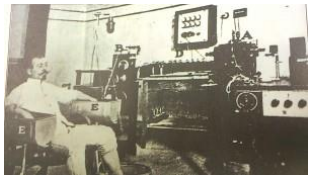

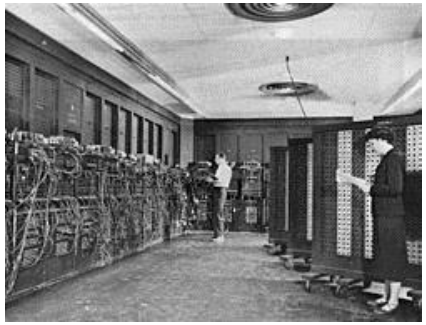

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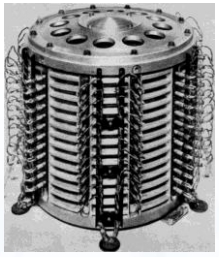
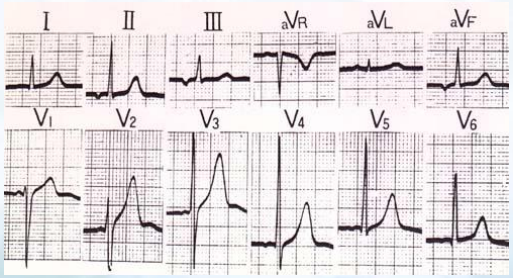
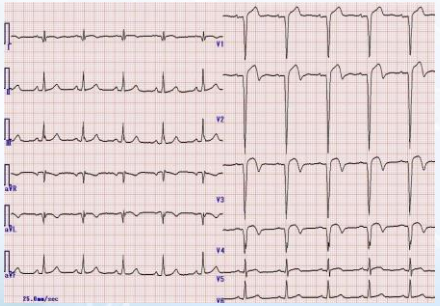
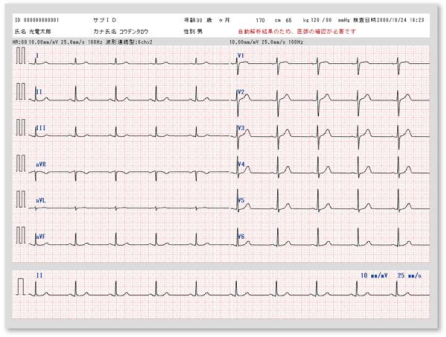


ISO International Organization for Standardization

2007年 ISO TS 11073-92001
2015年 ISO 22077-1







NIHON KOHDEN

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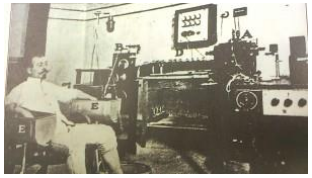
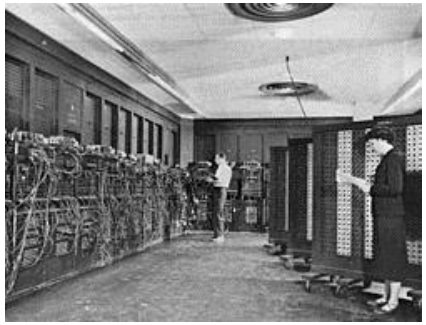
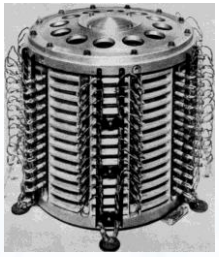


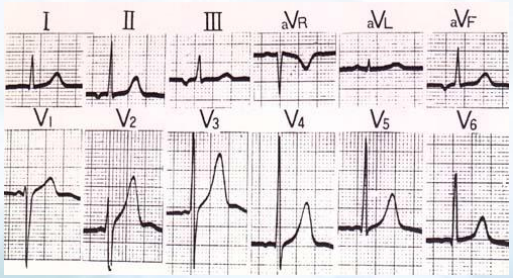


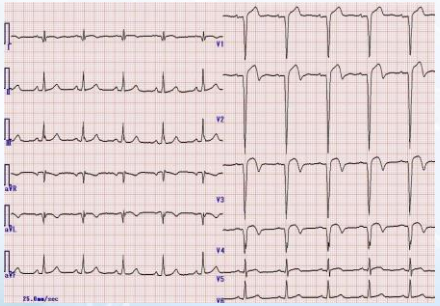
MFER Medical waveform Format Encoding Rules

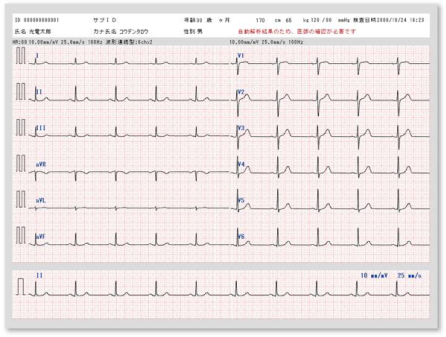


ISO International Organization for Standardization

FEM/BEM 順・逆方向
解法ツール類の整備







NIHON KOHDEN

MFERのコンセプト

- 単純
  - コーディングが容易
  - 検証が容易
- 忠実性
  - フィルタなどの処理はしない
  - プライバシー情報は記載しない
- 国際標準

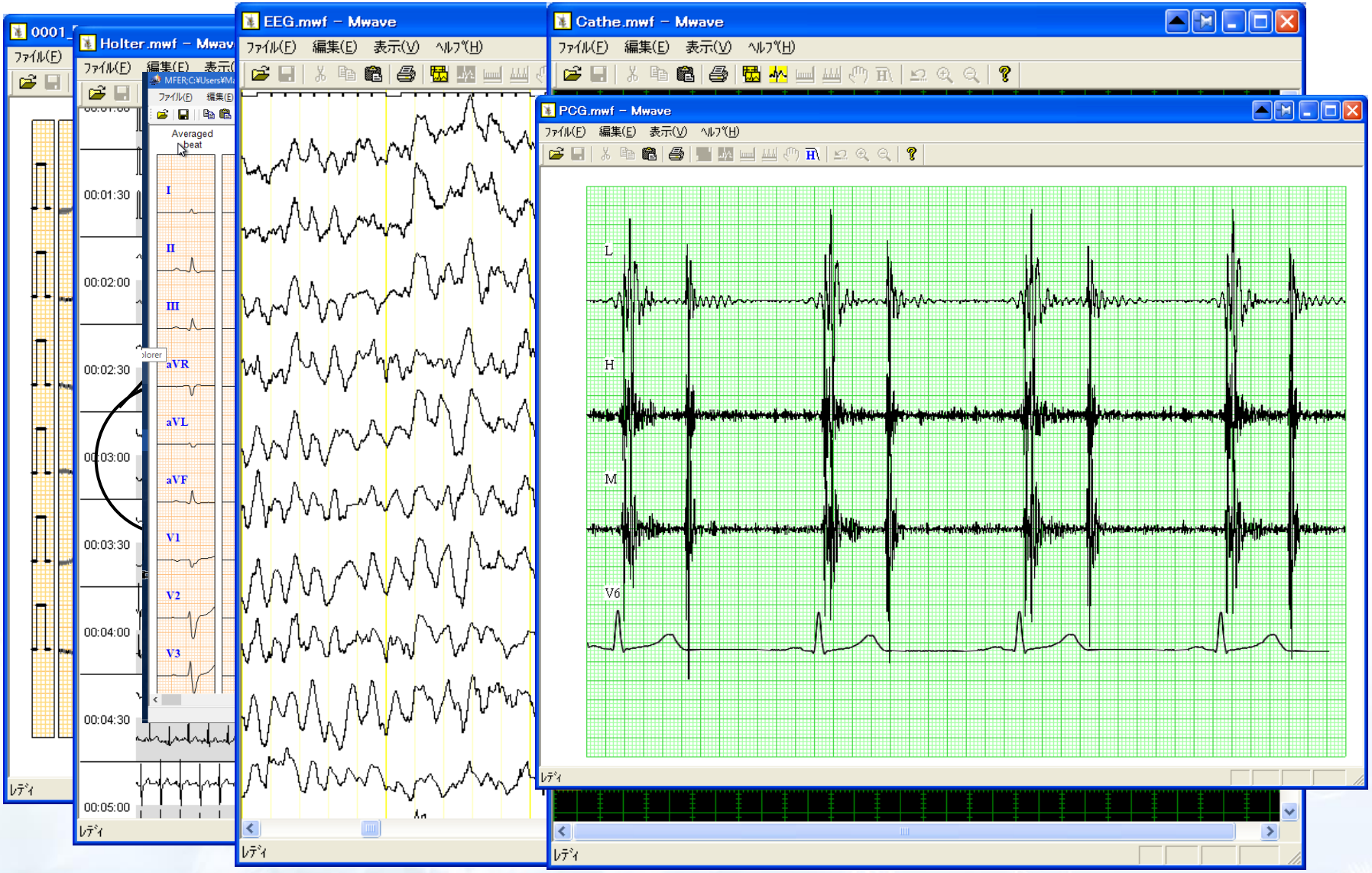
NIHON KOHDEN

- 脳波など他の医用波形への応用

- 規格制定とISO化
  - ISO 22077-1
  - ISO TS22077-2
  - ISO TS22077-3

  - ISO TS22077-4
    .
    .
    .

NIHON KOHDEN



NIHON KOHDEN

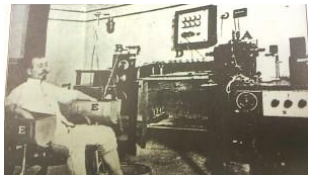
- ビッグデータの活用
  - 測定値
  - (逆、順方向の検証による)波形認識
  - 周波数領域?

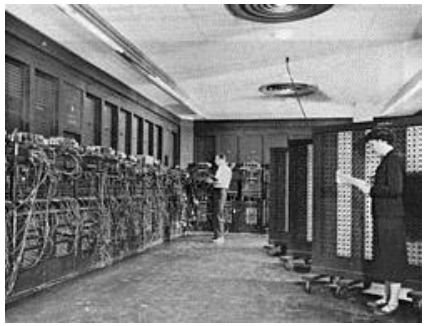
- 心電図波形と
  - 脈波、心音との連携
  - 画像との連携
  - 検査値との連携
  - 症例との連携

NIHON KOHDEN

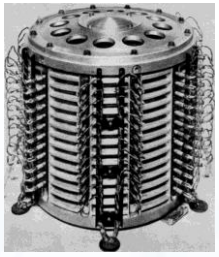
1900 1950 1970 1990 2000 2010・・・

アイントーヘン 心電図　ベクトル心電図





MFER Medical waveform Format Encoding Rules



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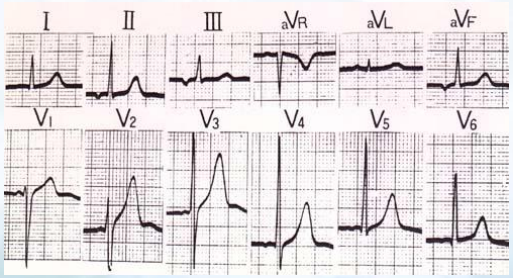
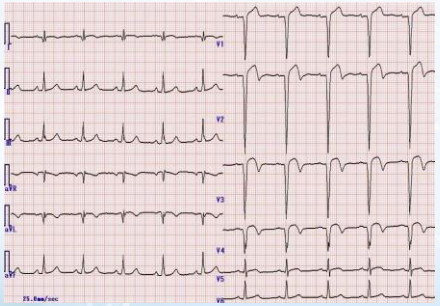
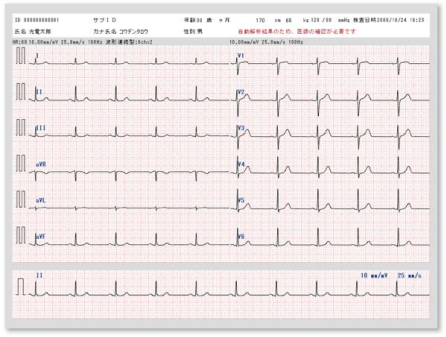
ビッグデータ、人工知能・・・・







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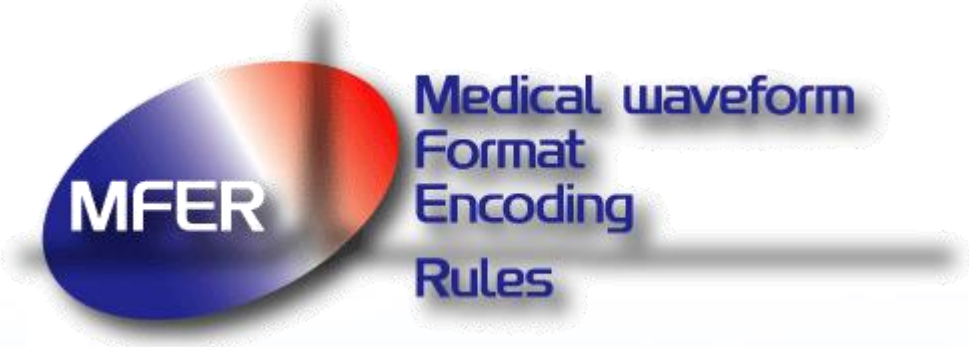

ご清聴ありがとうございました

NIHON KOHDEN